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Incorporating Army Design Methodology into Army Operations: Barriers and Recommendations for Facilitating Integration

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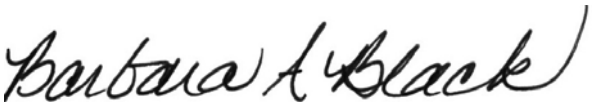

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14. ABSTRACT

With the March 2010 publication of FM 5-0, *The Operations Process*, the U.S. Army formally introduced Design into its doctrine (Headquarters; Department of the Army, 2010). Design is defined in FM 5-0 as "a methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them" (p. 3-1). Though many people contend that successful commanders have always performed Design, the codification of Design in doctrine represents a significant organizational change for the Army. Organizational change efforts are often met with resistance, and the intended benefits of the change may go unrealized. The goal of this research effort was to identify and document significant organizational barriers to integrating Design into Army operations, and develop recommendations for mitigating those barriers. The research team conducted a literature review and in-depth interviews with subject-matter experts to identify obstacles to adoption of Design. A number of barriers have the potential to create significant impediments to the integration of Design, including: terminology and language barriers, conceptual barriers, organizational culture barriers, command-level barriers, and applications barriers. A series of recommendations are made for mitigating the identified challenges and facilitating the integration of Design into Army operations.

15. SUBJECT TERMS
design, Army Design Methodology, organizational barriers, change management, planning, conceptual planning, operations process, discourse, critical thinking, systems thinking, complex and ill-structured problems

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INCORPORATING DESIGN INTO ARMY OPERATIONS:
BARRIERS AND RECOMMENDATIONS FOR FACILITATING INTEGRATION

EXECUTIVE SUMMARY

Research Requirement:

With the March 2010 publication of FM 5-0, *The Operations Process*, the U.S. Army formally introduced Design into its doctrine. Design is defined in FM 5-0 as "a methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them" (Headquarters; Department of the Army, 2010) p. 3-1). The intent of Design is to help Commanders respond more adeptly to interactively complex, dynamic, and novel situations. It emphasizes using collaborative discourse to develop a holistic understanding of a problem space so that the appropriate solution becomes apparent.

Though many people contend that successful Commanders have always engaged in Design-type activity, the codification of Design in doctrine nonetheless represents a significant organizational change for the Army. Organizational change efforts are often met with resistance, and the intended benefits of the change may go unrealized. Introducing an innovation, even when it is arguably an improvement over current practice, does not assure successful adoption of the innovation. A host of challenges that are often unrelated to the technical merits of new ideas can undermine successful implementation.

The goal of this research effort was to illuminate the issues associated with introducing Design into the U.S. Army. A primary focus of the project was to identify and document significant organizational barriers to integration and operational use of Design. The research team also developed recommendations for steps the Army can take to address the challenges and facilitate the assimilation of Design into operations.

Procedure:

The research team conducted three main tasks to identify significant obstacles to incorporating Design into operations. The first task was a literature review, focusing on military publications, doctrine, Combined Arms Center (CAC) blog posts, literature from the field of cognitive psychology, and literature from the field of organizational change. The second task was to conduct interviews with a variety of subject-matter experts, including those who teach Design, those who have received formal education in Design, and those who have applied Design-type activities in the field. The third task consisted of analysis and synthesis of the data, and development of recommendations.

Findings:

Analysis of the literature and data set reveals a number of barriers that are creating significant impediments to the integration of Design into Army operations, including:

- Terminology and Language Barriers—including views that Design and its introduction into the Army have been unnecessarily overcomplicated by lexicon that is dense, elitist, and inaccessible to the masses.
- Conceptual Barriers—including inconsistency in the definition and description of Design, differing views on who should engage in Design, and insufficient description of the gap Design is intended to fill.
- Organizational Culture Barriers—including a deeply entrenched paradigm of linear-reductionist thinking and a culture of deference to command hierarchy that are counter to the activities Design promotes.
- Command-level Barriers—including limited understanding of the benefits Design can offer Commanders and insufficient involvement of the Commander in Design activities due to competing demands for time and attention.
- Applications Barriers—including competing views on the degree to which Design should be structured and limited guidance on how to apply Design-type thinking in the real world where time and resources are constrained.

Although aspects of these findings have been documented elsewhere, there are currently no sources that address a comprehensive collection of barriers to adopting Design in the Army, nor that offer strategies for facilitating integration. Thus, this report offers a comprehensive account of the range of challenges affecting institutionalization of Design in the Army, in addition to suggestions for mitigating them. Recommendations are organized around the following topics: promoting Design within the Army, accumulating an evidence base, educating/instructing Design, rewards and incentives, facilitating the link to practice, and future research. The authors believe that awareness of the barriers and attention to strategies for addressing them will enhance the likelihood of effectively infusing Design into the way the Army does business.

Utilization and Dissemination of Findings:

The findings of this research can benefit a variety of stakeholders, including Army leaders who are communicating and educating forces on the concept of Design and its application, doctrine authors who will be evolving the concept of Design in future iterations of doctrine, and Commanders and planning staff who are implementing Design in military operations. The findings may also be useful for those seeking insight into future research needs.

INCORPORATING DESIGN INTO ARMY OPERATIONS:
BARRIERS AND RECOMMENDATIONS FOR FACILITATING INTEGRATION

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INTRODUCTION

In contemporary operational environments, military forces face increasingly complex, dynamic, and multifaceted challenges (Mattis, 2009; TRADOC, 2008; USJFCOM, 2010). Commanders and their staffs face a range of demands and operational missions that extend beyond conventional warfare between states to irregular warfare, where political, social, cultural, and military activities intermingle (Schmitt, 2006; TRADOC, 2008). The range and inherent complexity of today's military operations has underscored the need to consider alternative approaches to operational planning that will enable units to adapt to agile adversaries and affect change within complex, dynamic environments.

To address this need, the Army recently introduced the concept of Design into doctrine. Design[1] is defined in FM 5-0, *The Operations Process*, as "a methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them" (Headquarters; Department of the Army, 2010, p. 3-1). The intent of Design is to help Commanders respond more adeptly to interactively complex, dynamic, and novel situations. It focuses on developing a deeper and more nuanced understanding of a problem space so that the appropriate solution becomes more apparent. In essence, Design emphasizes framing the problem before attempting to solve it (Van Riper, 2011). So, whereas current Army processes like the Military Decision Making Process (MDMP) and Troop Leading Procedures (TLP) focus on solving a problem, design focuses on the nature of the problem.

Design is characterized by a set of cognitive activities, including non-linear thinking, systems thinking, critical thinking, creative thinking, and reflective practice (Banach & Ryan, 2009; Clark, 2010; Kem, 2009; Schmitt, 2006; Van Riper, 2011). These various cognitive activities are critical to continual learning and adaptation. At its core, Design is a collaborative process that involves the social construction of knowledge and shared understanding through a process of discourse (U.S. Army School of Advanced Military Studies [SAMS], 2010). Conceptually, Design is akin to team sensemaking, which is "the process by which a team manages and coordinates its efforts to explain the current situation and to anticipate future situations, typically under uncertain or ambiguous conditions" (Klein, Wiggins, & Dominguez, 2010, p. 304). Design is a process that enables Commanders and their staffs to develop a collective understanding of a situation (i.e., "What is the problem?"), identify an approach to solving it, and adjust that approach as new data changes their understanding of the situation (Banach et al., 2009; USJFCOM, 2010).

Design Through the Lens of Organizational Change

Many people contend that successful Commanders have been performing Design-type activities for centuries. Nonetheless, the codification of Design in doctrine represents a significant organizational change for the Army. In many organizations, change efforts are met with

[1] The Army has recently adopted use of the term "Army Design Methodology" to distinguish the methodology being taught at SAMS from other forms of design. However, the literature reviewed and the people interviewed through this effort overwhelmingly used the term "Design." To be consistent with the literature and the interview data, the authors use the term "Design" throughout this report.

resistance. It is not uncommon for the intended benefits of change to go unrealized. Introducing an innovation, even when it is arguably an improvement over current methods, does not assure successful adoption of that innovation (Nord & Tucker, 1987). Introducing new practices into an organization can present a host of challenges that are often unrelated to the technical merits of new ideas, but nonetheless undermine successful implementation. The source of these barriers can be at the individual, team, and organizational levels.

As the Design concept is promulgated through the Army, it is valuable to consider the factors that might either inhibit or facilitate the acceptance of Design across the force. A useful framework for considering these issues is Rogers' Diffusion of Innovations Theory (1995). Rogers describes how new ideas and practices are adopted in a group or organization, and outlines a set of key characteristics of an innovation that impact individuals' decisions to adopt it. Innovations perceived as being an improvement over existing practices, compatible with organizational norms and values, and simple to understand and use are likely to be adopted more readily than innovations that lack these characteristics.[2]

Within the diffusion framework, word of mouth is a critical element of influence. Opinion leaders have a unique and influential position both as change agents and within a system's communication structure, influencing potential adopters through their interpersonal communication networks in the community. These change agents may come from outside the organizational structure, but they operate within the cultural boundaries to influence decisions to adopt an innovation (Rogers, 1995). For example, Klein's Recognition-Primed Decision (RPD) model was initially developed to describe the decision making of Fire Ground Commanders (Klein, Calderwood & Clinton-Cirocco 1986; Klein 1989).[3] During the 1990's Dr. Klein and his colleagues conducted a number of research projects that led to interactions with leaders at National Defense University, the Army War College, Marine Corps Warfighting Laboratory, and elsewhere. The perspective on decision making reflected in the RPD model is now part of Army doctrine. The current edition of the *Army Field Manual on Command and Control* (FM 101-5) includes a section on intuitive decision making, based largely on the RPD model (Klein 2008). By introducing the concept of RPD to leaders who advocated for it, the concept was more readily accepted by the larger organization (e.g. education and doctrine).

While Rogers' theory describes characteristics of the innovation itself that contribute to adoption, Kotter (1996) offers a view of the processes necessary for effective organizational change. Kotter describes a series of steps that range from creating a sense of urgency, to articulating a clear vision for the change, to modifying existing processes that do not fit the new vision, to rewarding those who engage in the new practices. Organizations often skip important steps in this process in order to 'save time,' or they make critical errors in a given phase that slow momentum or negate the progress that has been made (Kotter, 1996).[4]

Viewing the Army's Design initiative through the lens of Rogers' (1995) and Kotter's (1996) frameworks of organizational change raises several questions for consideration. For example:

[2] For more detail on the "Diffusion of Innovations" theory, see Appendix A.
[3] The initial research conducted on the RPD model was funded by the Army Research Institute under contracts MDA903-85-C-0327 and MDA903-89-C-0032.
[4] For additional detail on Kotter's framework, see Appendix A.

- Has the Army articulated a clear vision for Design, and communicated that vision broadly and consistently?
- Has the innovation of Design—over and above mission analysis and conceptual planning—been well-articulated? Is Design perceived as an improvement over existing doctrinal practices?
- Is the practice of Design perceived as compatible with Army values and culture? If not, where does the incompatibility exist?
- Do members of the force have the opportunity to see results of Design application?
- Are examples or "small wins" showcased to demonstrate the value of Design?
- What incentives are in place for practicing Design? Are there disincentives in place that need to be removed?
- What major obstacles to implementing Design need to be removed so that the force is empowered to implement Design? What factors might undermine implementation of Design?

Consideration of these and other questions driven by theories of organizational change can provide important insight and direction for assimilating Design into Army operations.

Design literature and dialogue within the blogosphere offer an initial glimpse into a range of challenges that correspond to the issues described by Rogers (1995) and Kotter (1996). For example, there are indications that the Army has not articulated a clear and consistent vision for Design, as evidenced in part by inconsistent definition, description, and terminology associated with the concept (Nocks, 2010). There are signs that the innovation of Design over and above existing doctrinal practices has not been well-communicated, and that a clear need or purpose for Design has not been established (Elkus & Burke, 2010; Tippett, 2009; Vohr, 2009). There is evidence that Design is perceived by many as too complex, too laden with jargon, and suited only for the "smart guys" (McLamb, 2011; Yingling, 2011). Furthermore, there is evidence that some perceive Design to be incompatible with core aspects of military culture, including a deeply-rooted paradigm of linear and reductionist thinking and a propensity toward compliance, which are the antithesis of Design (Paparone, 2011; Zwiebelson, 2011).[5]

Research Objectives

While the literature provides a starting point, the goal of this research effort was to understand more deeply the issues associated with introducing Design into Army doctrine and education. A primary focus of the project was to identify and document significant organizational barriers likely to impede adoption of Design as the Army begins to incorporate it into operational use. A second goal of this research was to develop recommendations for steps the Army can take to address the challenges and infuse Design into its operations.

Specific research objectives were to:

- Identify experienced and anticipated obstacles to integrating Design into operational use.
- Elicit examples of Design from experienced Commanders and planners, and uncover associated challenges.

[5] For more detail surrounding barriers identified in the literature, see the Literature Review in Appendix A.

- Document findings and develop recommendations for mitigating challenges and facilitating the integration of Design into practice.
- Develop a resource that supports Commanders and planners in recognizing and addressing the challenges of integrating Design into operations.

Organization of Report

The remainder of this report is organized around three major sections:

1) Research Approach: describes the data collection methods, interview sample, and data analysis.
2) Findings: describes the key barriers in embedding Design into Army operations, along with recommendations for addressing the barriers. Recommendations were informed by the nature of the problems identified, as well as consideration of Kotter's (1996) and Rogers' (1995) theories of organizational change and diffusion of innovations.
3) Discussion and Recommendations: summarizes the report and the key set of recommendations for mitigating the identified barriers and facilitating the adoption of Design.

RESEARCH APPROACH

Literature Review

The purpose of the literature review was to familiarize the research team with the concept of Design and its history prior to collecting data and to complement data collection efforts to identify obstacles and anticipated challenges in integrating Design into Army operations. We examined Army and Joint doctrine, military papers and publications, monographs from School of Advanced Military Studies (SAMS) students, and blog posts from the Combined Arms Center (CAC) blog. We also examined literature from the field of cognitive psychology and literature pertaining to organizational change and diffusion of innovations. The literature review was used in conjunction with interview data to guide recommendations for integrating Design into operational use (for documentation of the Literature Review, see Appendix A).[6]

Data Collection

We conducted a total of 19 in-depth interviews with 24 participants. While the majority of the interviews were conducted with individual participants, three were conducted as group interviews. The interviews ranged from 30 minutes to 2 hours in length, with an average interview length of approximately 1-1/2 hours.

Participants. The interview sample included SAMS and Intermediate Level Education (ILE) instructors (N=12), current and former SAMS students (N=5), the Director and Deputy Director

[6] The literature review was written as a stand-alone product that summarizes the existing literature on Design and the documented obstacles to integrating Design into Army operations. The research team chose to interview several individuals who had published articles and/or posted blog entries on the topic of Design in order to understand the documented issues at a finer level of granularity. As a result of this approach, there is some overlap between the themes documented in the literature review and those documented in the report of interview findings.

of SAMS, and active and retired Commanders and Planning staff (Army, Marine Corps, and Air Force) with experience using Design in operational settings (N= 8)[7]. The nature of interviewees' experiences with Design ranged from teaching Design, to conducting Design in classroom exercises, to practicing Design in operational settings (e.g. OIF, OEF, EUCOM, and J5). In some cases, interviewees' operational experiences preceded the formal introduction of Design into doctrine. In these instances, operational experience does not reflect the specific methodology described in FM 5-0, but does reflect key elements of Design-type activities such as critical thinking and discourse. The range of ranks and number of interviewees holding each rank is displayed in Table 1.

Table 1

Ranks of Interview Participants

Rank	Service	N
Lt. General (Ret)	USMC	1
Major General	USMC	1
Colonel	Army	2
	USMC	1
Colonel (Ret)	Army	2
Lt. Colonel	Army	4
	USMC	1
Lt. Colonel (Ret)	Army	4
Major	Army	3
	USMC	1
	AF	1
Major (Ret)	USMC	1
Department of Army Civilian	Army	2

Procedure. The main focus of the interviews was to identify experienced and anticipated barriers to integrating Design into military operations. The interview was divided into three segments. Following elicitation of background information, the first segment of the interview focused on eliciting an example of Design (or an activity akin to Design) in which the interviewee was directly involved. In some cases, interviewees did not have such experience. For those who did, the interviewers explored topics such as who was involved in the Design process, how the team was selected, how the Design session unfolded, challenges encountered, and strategies used to manage those challenges. The second part of the interview focused on anticipated barriers to integrating Design across the Army now that Design is formally part of doctrine. Finally, the interviewers asked the interviewees about tools or resources that might be helpful to support the integration of Design into operations.

The interview team took extensive notes during the interview sessions. Three of the most information- rich interviews were transcribed. For the remaining interviews, an electronic data record was created for each interview from notes taken during the session and from listening to the audio recording. The electronic records were used in all subsequent analyses.

[7] Several interview participants had experience both as instructors and as operational planners.

Analysis

The research team conducted a thematic analysis of the data set, using qualitative analysis techniques described in Crandall, Klein, & Hoffman (2006). The thematic analysis followed an iterative and progressive process of data review and data structuring. Procedures involved systematic examination of individual interviews so that the findings and conclusions could be traceable to specific interview segments. The thematic analysis was conducted in three main phases: 1) an initial review of the data set, 2) systematic examination and data coding, and 3) synthesis and integration of findings. A description of each phase follows.

Initial Data Review: At the outset of the analysis effort the research team held a 1-1/2 day working session to identify and characterize preliminary themes in the data. The team used a process of inductive reasoning to generate a categorization scheme for the themes that emerged from discussion of the data. Examples of the thematic categories generated during this meeting included: communication and marketing of Design concepts, organizational challenges, Commander/leadership issues, evidence of validity and utility, and systemic educational challenges. The set of thematic categories that emerged from this meeting provided a preliminary organizing structure to use as the analysis team moved to the next phase of systematic analysis.

Systematic Examination and Coding: In this analysis phase, researchers conducted a systematic examination of each set of interview notes in order to categorize the full data set, assess prevalence of the themes identified in the team data review session, and identify other significant findings not captured in the initial examination of the data. The researchers employed a qualitative analysis software program (Dedoose) to segment, tag, and code the individual interview text files. DeDoose is a commercially available, web-based tool (http://www.dedoose.com) that enables uploading of text files, segmentation of data excerpts, application of pre-determined codes to data segments, and ability to write memos to capture additional ideas and insights as researchers examine data.

Once the interview notes were uploaded to Dedoose, the researchers created a set of codes that reflected the categories identified in the initial data review session (e.g., organizational issues, systemic educational challenges, etc). Researchers then conducted a “trial run” that involved applying the codes to a subset of the interview notes. This step provided a basis for refining the coding scheme. The outcome of this step was a final set of coding categories and associated category descriptions that were subsequently used to segment and categorize the full data set. Coding categories used in the analysis of the full data set included:

- Clarity of Design concept
- Lexicon and terminology
- Elitism
- Design instruction
- Systemic educational issues
- Link to practice: Operational issues
- Link to planning
- Examples/evidence of utility

- Role of Commander
- Compatibility with Army culture
- Compatibility with analytical thinking
- Suggestions and recommendations
- Other/miscellaneous

Each interview file was examined independently by two members of the research team for presence of material relevant to the coding categories. Each occurrence of relevant material was highlighted, tagged, and categorized. Some text segments were relevant to more than one coding category and, in those cases, they were assigned multiple codes. The coding effort produced 491 coded segments.

Final Data Review, Synthesis, and Integration

Once all interviews were coded, the next step in the analysis process was to examine the full set of interview segments contained within each coding category. Three research team members conducted this review independently and then worked as a team to determine how to most effectively structure and communicate the findings.

Analyzing the grouped set of interview segments was a necessary step to identifying additional findings not yet noted, solidify core themes, and identify sub-categories and relationships. The result of this analysis phase was a fairly large number of categories and sub-categories of findings. The research team collapsed the set of categories into a smaller set of high-level categories that reflected each primary barrier. These high-level categories were determined using a data reduction technique known as a category sort (see Crandall, Klein, & Hoffman, 2006). The category sort involved combining items that were most closely inter-related, as judged by the analysis team, and then developing a broad category label for those topics. It is through this process that the team arrived at the final set of descriptive categories presented in the Findings section of this report.

In conducting these analysis activities, the research team identified several topics to code in greater detail. For example, based on the recognition of significant variability in the way interviewees were describing Design, the analysis team decided to revisit the data set and tag all excerpts that defined or described Design. The team also identified instances where frequency counts would be helpful in illustrating the prevalence of particular findings, and conducted those counts (for examples see Tables 4 and 5). Finally, the team developed summaries of Design incidents based on excerpts describing examples of Design activity in the classroom or the field. (For examples of Design activity, see Appendix B).

FINDINGS

Analysis of the data set revealed a number of barriers and missteps that have the potential to create impediments to embedding Design in Army operations. These impediments cluster around five major categories: Terminology and Language Barriers, Conceptual Barriers, Organizational Culture Barriers, Command-level Barriers, and Applications Barriers. Table 2 summarizes these barriers.

Table 2

Summary of Barriers to Integrating Design into Army Operations

Barriers to Integrating Design into Army Operations	
Terminology and Language Barriers	• Perception that Design lexicon is over-complicated, dense, and elitist • Lack of consistent terminology; the lexicon continues to evolve • Language has fostered a sense of divisiveness and an 'us vs. them' mentality
Conceptual Barriers	• Inconsistent definition and description of Design • Lack of agreement as to whether Design is new vs. mission analysis by a new name • Insufficient description of the gap Design is intended to fill • Inconsistent views on the operational level at which Design is appropriate • Lack of clarity on how Design connects to other planning activities, specifically to the Military Decision Making Process (MDMP)
Organizational Culture Barriers	• Strong cultural tradition of reductionist-analytic thinking • Culture of deference and obedience to authority • Incentive systems that do not encourage thought processes that are characteristic of Design
Command-level Barriers	• Insufficient Commander involvement in Design • Competing demands for Commanders' time and attention • Limited understanding of when to use Design and the benefits it offers • Mismatch between personality/leadership styles of typical commanders and those needed for Design
Application Barriers	• Disagreement over whether (and to what extent) Design should be proceduralized vs. remain more conceptual in nature • Lack of examples and evidence of utility • Practical challenges of applying Design in the real world, such as recognizing situations for which it is appropriate, building the Design team, and facilitating discourse

To give a sense of distribution and prevalence of the five major barriers identified across the data set, Table 3 provides a depiction of the interviews in which each barrier was described. As illustrated in the table, conceptual barriers and application barriers were most prevalent across the data.

The following section provides detailed discussion of each of the five major barriers, along with excerpts from the interviews to illustrate major findings drawn from the interview data. Following a description of each of the barriers, a final section offers specific recommendations for how the Army can address them.

Table 3

Distribution of Barriers Identified across Interviews

Barrier Category	Interview																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Terminology and Language Barriers				✓		✓				✓			✓		✓		✓	✓	✓
Conceptual Barriers	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Organizational Culture Barriers	✓	✓	✓		✓							✓	✓	✓	✓	✓	✓	✓	✓
Command-Level Barriers	✓	✓	✓	✓	✓				✓		✓	✓			✓	✓	✓	✓	✓
Application Barriers	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	

Terminology and Language Barriers

The manner in which Design was first introduced and communicated to the Army has had some unintended and unfortunate impacts. More than half of the interview participants described pronounced negative connotations associated with Design, including an air of elitism that surrounds the topic. Advocacy by at least some of Design's proponents has been viewed as off-putting. A recent article by the former Director of SAMS acknowledges that "…the common tendency to discuss [Design] methodology with zealous propagandizing is far from helpful" (Grigsby et al., 2011p. 29).

One reason that Design may be viewed as elitist is the language used to describe its philosophic roots, concepts, and constructs. For example, many have found Naveh's (1997) writings on the topic dense, convoluted, and difficult to follow.

> *Naveh's terminology is so esoteric. It discourages people who aren't on an intellectual bent.*[8] (Operational Planner; SAMS graduate)

Language that surrounds discussions of French Post-modernism is similarly inaccessible for many Army Commanders and their staffs. The writings on Design have been described as "poorly articulated, unnecessarily complicated, and generally infused with a preference for vague and uncommon terminology over clear and concise language" (McLamb, 2011). For at least one quarter of the Army interview participants, the language that surrounds Design fosters divisiveness and promotes a view of an 'inner circle' of Design adherents who are privy to knowledge and insight that others (outside the circle) lack:

> *The language is dense and impenetrable, clouded in mystery. Design was portrayed as something that only those with an elite education can grasp.* (Strategist; Instructor, CGSC).

> *The main barrier was that Design was adopted from academia. We took their jargon, their lexicon. Now only the "initiated" understand those terms…The*

[8] Italicized, indented text represents quotes from SME interviews.

> *language became a sort of credential. The operators in the field didn't have the 100+ hours on Design theory. There was the Design "priesthood" and then there was everybody else.* (Design Instructor, CGSC)

> *There was a condescending attitude when talking to the field. We'd say: Design is coming, but you don't know how to do it. Only <u>we</u> know how to do it. Others were treated as dummies. The field didn't like that.* (Design Instructor, CGSC)

Use of the label "Design" itself has posed barriers. Some do not view the label as intuitive, recognizing that Design can mean different things to different people. As an interviewee described:

> *If you go to Google and type in "Design," you'll find that the word is used to mean a wide variety of things…"Design" is a fancy way of saying you ought to step back and think about the problem before you jump into it.* (Army officer, SAMS Fellow)

The barriers that language and terminology present to acceptance of Design can be addressed in a couple ways. First, it may be helpful for Design instructors to be aware of the consequences of 'us vs. them' attitudes among their students. Fostering a sense of belonging to an inner circle of Design advocates may actually create impediments to adoption of Design. A more productive stance might be to position SAMS graduates to serve as change agents in the operational world. Doing so would require providing practical guidance for transitioning knowledge of Design theory and practice to the field.

The barriers might also be addressed by consistent efforts to communicate in ways that focus on the activities underpinning Design (e.g., critical thinking, creative thinking, reflective practice, discourse) and the utility and application of Design, rather than its conceptual lineage. Clearly, there is a community interested in the conceptual and philosophical foundations of Design who desire to continue writing, thinking, and talking about those aspects of Design. As important and interesting as that dialogue is, it may be helpful to separate the dialogue that surrounds the conceptual, theoretical constructs that underlie Design processes from the exchange of ideas and experiences that pertain to its real-world application. For example, one interviewee noted:

> *The word 'problematize' is very important in the Design community. But I wouldn't use that word in Afghanistan. Instead you have to find a similar word that's in the vocabulary of the words others understand.* (Operational Planner; SAMS graduate)

One of the ways that Army leadership has chosen to address barriers surrounding Design lexicon is to adopt the label "Army Design Methodology" in lieu of the term "Design," in an effort to shift focus away from the philosophy and more toward application. However, one interviewee noted that this shift could be problematic.

> *They're now labeling it 'Army Design Methodology.' I disagree with that. If you put Army in front of it, you automatically bound it. At the Joint level - which is really where we're supposed to be operating - other services will resist. Design is supposed to be holistic. It's supposed to be a much larger process. A less offensive term would be: 'Military Design methodology.' If you say 'Army Design Methodology,' the Chief of Staff*

> *in the room or the Air Force General will roll their eyes at you because it's Army."* (Operational Planner, SAMS graduate)

Thus, while the change in terminology may be helpful in addressing some existing barriers, it is important to also recognize the potential challenges that may arise with this shift in terminology.

Conceptual Barriers

A related set of barriers that surfaced in the interview data surround insufficient clarity of the Design concept. Conceptual barriers are reflected in the variety of descriptions and definitions offered for Design, the variety of perspectives on who should employ Design, the differing views on how to teach Design, and insufficient description of the purpose of Design.

Lack of Conceptual Clarity: What is Design?

There are an array of descriptions and definitions used in discussing Design. People have described Design as a philosophy, a mindset, a cognitive tool, and mental approach, a process, a method, and a way of life. Those who have written about and taught Design have used different terms for the same concept, and the same terms for different concepts. The proliferation of writings on the subject, with the divergence in terminology, has been a source of confusion (Nocks, 2010).

At the time of this research project, there was not a core curriculum for teaching Design, and instructors differed in the vocabulary, content, and views they convey in their courses. As described by two instructors:

> *One problem we have is getting a common understanding across instructors of what Design is and how we teach it.* (Strategist; Instructor, CGSC)

> *We just flat don't agree on what we're talking about. Some say it's just an improved version of mission analysis and we already do this…and there are others who talk about French post-modernist influence and architectural theory. Those are the two ends of the spectrum that we're trying to bridge… We don't have commonality of language.* (Design Instructor, SAMS)

As Design is a relatively new addition to doctrine, it is in the process of concept refinement. So these differences are not surprising. Even so, the variability of descriptive terms and definitions represents a challenge for Army commanders and staff who want to learn more about Design and infuse it into their operations.

The range of views and attitudes towards Design led the research team to speculate: Is there a central concept of Design, and people have differing views on that central concept? Conversely, is part of the variability of attitude a reflection of the lack of agreed upon central concept and that people mean different things when they talk about Design?

With those questions in mind, the researchers examined how participants in the interview sample described Design. All statements that contained a definition or description of Design were catalogued and classified by content. It is worth noting that interviewees offered the descriptions

and definitions spontaneously, rather than in response to a specific request for a definition of Design. The analysts identified a total of 56 excerpts that contained specific descriptive statements. Table 4 summarizes the subset of the interview data examined and themes and categories that were identified.

Table 4

Definitions and Descriptions of Design

Design is…	Number of Comments	% of Total Comments
Framing/Reframing/Understanding the problem	15	27%
Critical and creative thinking	9	17%
Discourse; interchange of ideas	7	13%
Process/tools to manage complexity	5	9%
Support for Commander's thinking	4	7%
Conceptual planning	4	7%
Part of MDMP ("We already do this…")	2	4%
Systems thinking	2	4%
Involves multiple perspectives	2	4%
Search for knowledge; continuous learning	2	4%
"Wide array of things"	2	4%
Linking strategic objectives to tactics	1	2%
Developing holistic understanding	1	2%
Total	56	100%

When interviewees described Design, they did not articulate a consistent, central concept. They referenced differing elements and reflected differing views regarding what constitutes Design and how or why it is useful. It is likely that the considerable variability in how Design is described and defined reflects the fact that Design is a complex, multifaceted activity. In addition, some of the discord and lack of consensus about Design may be due to this multifaceted aspect, because people may be responding to the particular aspect of Design that resonates with them. Some of the disagreement over whether or not Design is new, when to do it, and who should do it may occur because people are considering different facets of Design (e.g., the critical thinking component vs. discourse vs. a specific manifestation of it—e.g., "Army Design Methodology").

One means of addressing the challenges and removing barriers may be to establish a clearer definition of the concept when communicating about Design[9]. In some cases this already occurs, but not consistently. The authors are not suggesting that everyone needs to agree on a single definition. However, it would be helpful for instructors, students, writers, bloggers, and others interested in Design to provide specific descriptions of how they define Design, and the particular aspects of Design they are addressing. It would be analogous to providing an operational definition of a construct in a description of research methodology. It would allow a

[9] The Army has provided a definition of Army Design Methodology in the March 2010 publication of FM 5-0, *The Operations Process*. The operationalization of the definition will provide a foundation for understanding the concept of design.

sounder, more consistent basis for ongoing dialogue, make similarities and distinctions clearer, and make the basis for agreements and disagreements more visible.

Is Design New?

Part of the conceptual challenge associated with Design is reflected in a debate regarding whether or not Design is new. One point of view is that the force has been engaging in Design-like activities for years and that components of Design, such as critical and creative thinking, have always been part of doctrine (i.e., as part of mission analysis, conceptual planning). Another point of view is that Design is a distinct and innovative departure from standard planning processes. The following interview excerpts provide examples of these differing views:

> *Design is nothing new. Planning teams already do this. It's a pre-MDMP type of step. It's figuring out: what is the problem*. (Operational Planner, SAMS graduate)

> *I disagree with the idea that Design is something we've always done and we just didn't call it Design. I don't think so. My peers and I have heard it posited by people much senior than me, both active and retired, that we've always done this. We have done things that solicit Commander's input into the planning process. But I don't think we've always done Design.* (Planner, USMC)

> *I feel very strongly that Design just tries to capture best practice. But people who started to doctrinalize it thought they came up with something new. Anybody in Iraq thought their units had done something similar.* (Operational Planner, SAMS graduate)

> *We completely oversold the product, to the point that it's laughable. "A fundamental change in the way we think?" No. This is not a fundamental change in the way we think.* (Army officer, SAMS fellow)

Across these two perspectives, there does appear to be agreement that the goals associated with Design are contained in the mission analysis component of the MDMP. For example, "Many military professionals charge that Design is just MDMP's mission analysis on steroids" (Zweibelson, 2011, p. 1). However, even though Mission Analysis is sanctioned and taught as part of planning, the interview data suggests that in operational settings, it is a process that is practiced inconsistently. Engaging in Design-like activity is seen as idiosyncratic and reflective of a certain command style. For example:

> *It's implied in the MDMP that you'd do these Design activities. But people haven't.* (Tactics Instructor, CGSC)

> *The best Commanders always did Design. But most Commanders don't do it, even though we have theory and doctrine that says they should.* (Design Instructor, CGSC)

> *You'll hear people say good Commanders always did [Design]. But we also have plenty of examples where it didn't happen. And both types of people are products*

of this institution. So why does it happen in some cases and not others?
(Strategist; Instructor, CGSC)

Another aspect of the discourse surrounding the newness of Design concerns the types of problems Design is intended to address, and whether the military's experience of those problems is new. One perspective is that Design is a necessary response to changing missions and types of problems the military is being asked to handle (Mattis, 2009; Schmitt, 2006; TRADOC, 2008). From this point of view, even if Design is not entirely new, the range and complexity of the problems that the military faces represents a significant shift that requires a different approach to planning. It is increasingly the case that for commanders and their staffs, ill-structured, complex problems are no longer the exception; they are the new normal. The tools and processes emerging around Design are a response to that shift, and reflect innovation in the face of the new normal.

Finally, some of the disagreement regarding Design's newness reflects a continuing discussion regarding the differences between "ill-structured" problems, "complex" problems, "structurally- vs. interactively-complex" problems, "wicked" problems, and those that are simply "unfamiliar." This is an important discussion because it has an impact on when Commanders and their staffs should engage in Design. But making these fine distinctions may not be productive for purposes of Design application. From the authors' perspective, arriving at an understanding of whether a problem is, or is not, 'unfamiliar,' 'complex,' or even 'wicked' requires the very efforts to understand the nature of a problem that Design supports. To help address the issue, it may be worthwhile to shift the discussion toward a description of the practical triggers that indicate Design might be useful. Some examples of practical triggers drawn from the interview data include:

- Is enough known about the situation to move forward in a meaningful way? Is a course of action clear and evident? (If not, then Design might be useful)
- Are current actions having unexpected and/or surprising effects? (If yes, then Design might be useful)
- Is the desired end-state, itself, unclear? (If yes, then Design might be useful)
- Are actions and techniques that were originally effective falling short of having the desired impact? (If yes, then Design might be useful)

Providing guidance for Commanders and their staffs about conditions under which Design is useful will likely help clarify the Army Design Methodology and indicate how it is different than other planning methodologies.

Inconsistent Views: At What Operational Level is Design Appropriate?

Contributing to the lack of conceptual clarity surrounding Design is a set of inconsistent views on who should employ Design. The interview data illustrate conflicting perspectives on the appropriate echelon for Design. For example:

*Design is really for **the operational level of war**. (Commanding General, USMC)*

*In my eyes, **the Division-level is as low as it can go**. Maybe a brigade combat team.* (Operational Planner, SAMS graduate)

*You shouldn't have Design at the strategic level, operational level, or tactical level. **You need to approach a complex environment with Design at every level. The main effort would be at the tactical level. That really is Design: interacting and experimenting.** The other levels of Design is taking what they're doing, figuring out whether it's working or not, and then resourcing them as appropriate. **The tactical level is where the majority of Designing is.*** (Operational Planner, SAMS graduate)

*The **amount of conceptualization needed at the tactical level is less than at operational and strategic level**. You know what you need to do.* (Instructor, SAMS)

***Design is not for the battalion level or below. Certainly not at the company level**. It'd be hard for a Company Commander to discourse with Sergeants.* (Former Brigade Commander)

*It's **not necessarily reserved for a particular level**. It's long-term planning, and you do long-term planning at all levels.* (Operational Planner, USMC)

*Some say it's only for the Combatant Commanders…my view is that **it has nothing to do with the size of the unit.** It has to do with the nature of the problem.* (Senior Mentor, Unified Quest; Instructor, USMC Command and Staff College)

As these interviewees' quotes indicate, there is a range of opinions on where Design is appropriately located. A possible explanation for the degree of variability is that people may be focusing on different aspects or components of Design when considering the appropriate echelon for Design. For example, in discussing the appropriate echelon for Design, some refer to discourse, some to critical thinking, some refer to systems thinking. What accounts for the different boundaries people are setting remains a question. This is an area that warrants a deeper look to understand the intersection between how people are defining Design and their understanding of how, when, and at what level it is appropriately applied.

How Does Design Link to Planning?

Despite the diverse views about the nature of Design, the appropriate echelon of focus, and whether or not it is new, there is a consensus view that Design is closely linked to planning (noted by almost two-thirds of the participants who commented on this topic). Banach et al. (2009) noted that "For Design to be useful in the military domain, it must complement and interact with existing planning doctrine" (p. 106). Grigsby et al. (2011) argue that thinking of "Design" and "planning" as two distinct components is flawed and only creates confusion.

However, a number of participants also express concern that Design has been treated as distinct and separate from planning in current doctrine (as evidenced by the stand-alone chapter on Design in FM 5-0), in the way it is taught and, in some cases, in the way it is practiced. The

disconnect is viewed as having a number of negative consequences. One-third of participants who commented on this topic noted difficulties they and/or their students had in understanding how to integrate Design processes and products into the overall planning activities. Specifically, interviewees noted questions such as: How does it fit with MDMP? Does it add to, replace, or precede MDMP? How does it inform or enhance other activities in the operations process? How should (and how can) Design outcomes feed detailed planning? As described by one interviewee, reflecting on his Design education:

> *We weren't really given any practical experience with affecting change in a complex environment. It was all theory. It wasn't tied to operations. It wasn't really even tied to plans. We just took the planning part for granted. It was sort of skimmed. So turning Design efforts into a plan or operations, we didn't really do that very well.* (Operational Planner, SAMS graduate)

The link between Design and planning is an area where clear guidance, practical advice, and real-world examples would be helpful.

Articulation of Purpose

Analysis of the data also identified a gap in the information the Army has provided regarding Design. One-third of Army interview participants expressed that the Army lacks a clear, specific, and well-understood statement of purpose associated with Design. A consistent question threading throughout the interview data is: what is the issue or problem that Design is intended to address? What gap is it filling? The U.S. Army is a solutions- and action-oriented organization. The lack of a clearly articulated purpose for Design poses a significant barrier in adoption of Design. As described by interviewees:

> *If design is a new product, Army needs to explain the gap that design is intended to fill.* (Instructor, CGSC)

> *We never explained adequately: here's a problem and here's a solution to that problem. We're selling a product the field didn't know it needed. There needs to be an explanation of what the gap is; why we think Design is relevant.* (Design Instructor, CGSC)

We recommend that the Army arrive at a definitive, focused, operationally relevant statement of the purpose for Design and the problem it is intended to address. The Army should institutionalize its problem statement so that it is conveyed as a consistent message associated with Design.

Organizational Culture Barriers

Interviewees described a variety of ways in which Design may be incompatible with aspects of Army culture. Each of the potential sources of incompatibility is described next.

Tradition of Analytic Thinking

The Army is heavily steeped in a tradition of analytical, linear, and reductionist thinking

(Paparone, 2010a, Tippet, 2009; Zweibelson, 2011). Forces have been using rational-analytical models for planning and decision making with great success throughout much of the Army's history. The challenge is that elements of Design-type thinking, such as critical, systemic, and non-linear thinking are a significant departure from how forces have historically been educated to think and reason. The analytic-reductionist approach within the Army is so pervasive and deeply entrenched it poses a key challenge to adopting markedly different ways of thinking and making sense of the world. As articulated by interviewees:

> *The type of approach the Army has used for almost a century is the analytic model. It's institutionalized. Most of our decision systems are based in rational analytic models…We've rationalized everything. We use it for all problem areas.* (Instructor, CGSC)

> *This paradigm of multiple courses of action and analysis is so strong...We just keep holding onto it.* (Senior Mentor, Unified Quest; Instructor, USMC Command and Staff College)

> *The way the military thinks is that you can start with your end state first. This is where Design is facing barriers. Even at the strategic level, we're thinking very linearly. We're reverse engineering from a* predetermined *future end-state. A complex system is not going to allow you one fixed end state you can control. We subscribe to this flawed way of thinking - a linear fallacy - from the highest levels of strategic thinking all the way down. All our planning, all our narratives, drives down this linear road. This is the way we see things, discuss things, and act.* (Operational Planner, SAMS graduate)

Further, the amorphous and abstract qualities of Design necessitate a level of comfort with unstructured, ill-defined processes that are in stark contrast to the well-defined traditional planning processes like MDMP:

> *There's something about the traditional analytical approach that makes people so comfortable. There is structure, there are products, and we know who's in control.* (Senior Mentor, Unified Quest; Instructor, USMC Command and Staff College)

> *I see people who are uncomfortable with ambiguity, uncomfortable with uncertainty; they need things to be locked down. They're going to create problems in Design. They'll collect all of the tools and they'll completely lock out all of the flexibility.* (Instructor, SAMS)

> *There is resistance [to Design] from people who like structure. They have invested a lot in learning MDMP and they don't want to learn something new. It's a sunk cost. At the Major level, it's not too bad. But as you get up into Colonels and Lt Colonels, you get problems.* (Instructor, SAMS)

Members of the Army—and the military more broadly—have clearly invested significant resources and effort to learn and develop expertise in structured, analytic, planning and decision making methods such as MDMP. Promoting alternative cognitive approaches might be seen as

suggesting that traditional methods are ineffective or insufficient. One consequence of that implicit message could be resistance to less-structured approaches by those who have experienced the utility of traditional planning methods over the course of their military service.

Importantly, most interviewees argued that the rational-analytic model should not be abandoned nor its value diminished. Part of the challenge of moving beyond over-reliance on an analytic framework is recognizing the situations for which the rational-analytic mindset is entirely appropriate and useful, while also recognizing when an alternative way of thinking might be more suitable. Commanders and planners do not have to strictly adhere to one method or the other, but recognize the situations for which a given approach is more beneficial.

Almost one-third of the interview participants argued that for the Army to embrace Design-type thinking, it will require a paradigm shift. One aspect of that paradigm shift is a transformation in how military forces are educated. In order for the fundamental elements of Design (e.g., critical thinking, creative thinking, systems thinking) to take hold in the Army, these cognitive skills need to be woven throughout the curriculum so that they become institutionalized. Forces need exposure, throughout their professional military education (PME), to a wider array of cognitive styles that promote adaptive problem solving and decision making, so that they become an integral part of the cognitive landscape in the Army.

Team and Interpersonal Skills

Design not only requires a certain set of cognitive skills, but also requires particular interpersonal and leadership skills. The nature of problem sets appropriate for Design are far too complex for any single individual to grasp and make sense of. The activity relies on leveraging multiple, diverse perspectives and knowledge to construct a holistic understanding of a problem space. Yet the team, interpersonal, and leadership skills required for Design may need to be more deeply embedded within military education. For example, one interviewee noted that facilitating discourse is a critical skill for Design, but is not explicitly taught within the military education system:

> *The aspect of discourse, doing that well is a talent. It's a skill to facilitate a useful session of discourse…It's difficult to work the crowd, to organize it, and have discipline yet maintain flexibility within that process. All those things we don't teach anyone… There are workshops and things in the civilian world. But we don't teach taking a group of disparate individuals, and harnessing their cognitive skills through a disciplined process*. (Operational Planner, USMC)

Further, the skills required to build relationships and trust among staff members are central to creating an organizational climate in which staffs are comfortable questioning each other (and their leadership) and expressing alternative points of view. For Design to have its intended benefits in operational settings, members of the Army must have ample opportunity to develop team skills as part of their education and training.

Obedience and Respect for Authority

Another factor that may pose obstacles to adoption of Design is the Army culture of obedience and deference to hierarchy. For Design to work, staffs need a higher authority not only willing to

sanction Design, but also to be receptive to processes such as dialogue and push-back that Design involves. Depending on the characteristics and the willingness of the Commander to open the door to Design, these behaviors may or may not be perceived as appropriate and supported. The spirit of discourse and critical thinking that are hallmarks of Design were characterized in nine of the 19 interviews as out of place in an organization that values and encourages uniformity, centrality of command, and obedience to orders. For example, interviewees noted:

> *If you dare say to your boss: "I know you want us to do X, but we should really do Y," that is insubordination. The system of logic in detailed planning does not allow military to think outside the box. That's why we always rely on MDMP. We always do exactly what commander wants.* (Operational Planner, SAMS graduate)

> *There's a very real reason why many people aren't critical thinkers. We indoctrinate critical thinking out of them. You have to respond unhesitant to sacrifice your life for the mission. A critical thinker would not do that*. (Former Brigade Commander)

> *The beauty of Design is that it's not hierarchical; it's not reductionist. You have adaptation, innovation, and creativity coming from any direction. This against what we're professionally educated to do, which is uniformity, prescription, obedience, hierarchy.* (Operational Planner, SAMS graduate)

> *I have observed an unwillingness of different ranks and different experiences to accept all inputs as valid. I think that is counterintuitive to the military. We are a hierarchical organization and rank structure stands in the way of honest discourse.* (Operational Planner, SAMS graduate)

One argument related to cultural incompatibility is that Design violates the assumption that the Commander is always the smartest, most knowledgeable person in the room.

> *At the tacit level, what we all assume is that Colonels are smarter than Lieutenants, because it's always been that way.* (Tactics Instructor, CGSC).

> *The planning culture supports a form of power leadership where the leader knows the answers*. (Operational Planner, USMC)

Defaulting to an assumption that the Commander is always the smartest person in the room has the potential to stifle discourse and innovation and inhibit the ability to draw important insights from those lower in rank. To integrate Design effectively into Army operations, it requires a recognition and willingness across all ranks to accept that the Commander may not always have the most knowledge about a complex, unfamiliar situation. The point is, in the face of these complex problems, *nobody* has complete knowledge about a situation; the knowledge resides in different places. That is precisely why it is important to bring multiple minds to bear on the problem, and provide a venue for critical, creative thinking.

> *Culturally, we have to learn how to treat the Colonel…he has to learn how NOT to be the smartest person in the room, and to insure that the other people in the room act as if he really isn't the smartest guy in the room.…There are times when*

> *we need the Colonel to be the Colonel and to tell us what to do…But then there are times when we're in problem sets when he has to also be the dumbest guy in the room, and that's okay.* (Tactics Instructor, CGSC)

Accepting this stance does not mean the Commander cedes authority. In fact, it is the Commander who sanctions the critical thinking activity. The Commander provides the "license to think" – or the freedom to engage in critical thinking, questioning of assumptions, and discourse. But the Commander can also take that license away when deemed appropriate:

> *Allowing subordinates to challenge you doesn't necessarily mean you're not in charge. Eventually decisions have to be made and when that happens people should fall in line.* (Former Brigade Commander)

The reality that the military is a hierarchical system and that the Commander has ultimate responsibility for the mission is unlikely to change. It is an element of the social contract deeply embedded in the military tradition. To address the perception that Design is incompatible with this aspect of military culture, the Army needs to communicate the message that Design *can* be an activity that fits within the military hierarchical structure. Design can be part of the traditional orders process, driven and sanctioned by Commanders.

Rewards and Incentives

An additional aspect of Army culture described as a potential barrier is the Army's incentive system. Current Army reward mechanisms—both implicit and explicit—may not fully encourage and reward the type of thinking that Design requires. The Army is a results-driven organization that tends to reward actions, outcomes, and obedience—not critical thinking, debate, and questioning assumptions. As an interviewee noted:

> *The promotion system in the Army is not really kind to thinkers. Out of box thinkers are not rewarded. Most commanders get promoted based on tactical performance.* (Former Brigade Commander)

There is a perception (reflected in one-fifth of the interviews) that the fastest way toward advancement in the Army is to acquiesce and conform, rather than to question. Interestingly, one retired Colonel argued that this cultural propensity was not always as deeply ingrained as it is now. Critical thinking and discourse may have been more central to the Army culture during other points in history:

> *The way strategy was hammered out in the inter-war period was really messy, but it was exactly this type of discourse we're talking about. People would put ideas on the table, and people would dispute them. There would literally be shouting matches. One time in November 1943, Americans were pressing Brits to agree to invasion of Normandy the following spring. Churchill was making one last desperate attempt to continue operations in the Mediterranean. He puts on the table the idea for invading the island of Rhodes off the coast of Turkey. General Marshall looked at Churchill and said: "Not one G-damn soldier is going to die on this beach." Something like that. It was a General telling this to a Prime Minister. That's the type of discourse that was ongoing there. And it was both*

> *sides. Brits were equally vehement about things. What I found in my historical study was, the sharper the disagreements over strategy, the better the outcome. The harder it was tested. The more the people really had to show the logic behind their thinking and prove their theories, the better the outcome…*
>
> *…Over time we've come to see sharp disagreements as unseemly. And people have suffered for that. Now if you have a sharp disagreement with a superior officer, instead of saying: 'that guy is really candid,' you say 'that guy's not getting promoted.' So you end up with a go-along get-along crowd that is very collegial, but that might not lead to the best strategic outcomes. They've forgotten how to discourse, how to debate, how to be passionate, how to challenge the thinking of others. It's a really hard solution to that one because it's a cultural thing now. People are going to follow the path of least resistance to get to the top. If people see that's the way to behave to get to the top, that's the way they're going to behave. Give the Commander what he wants, don't make waves.* (Former Brigade Commander)

For Design-type thinking to take root within the Army, it is important to examine the types of behaviors and thinking that are encouraged and rewarded, both implicitly and explicitly. The Army needs to establish mechanisms that will incentivize and reinforce the behaviors and thinking that characterize Design. Leaders need to be aware of the role they have in incentivizing this type of thinking. As described by one interviewee:

> *As leaders, we have the responsibility to bestow intrinsic incentives through example, through giving them a license to think.* (Strategist; Instructor, CGSC)

Important to note is that the Army is not the first organization that has struggled with breaking the authority barrier so that inputs are heard and valued. The adoption of Crew Resource Management (CRM) within the airline industry, for example, stemmed from the need to encourage push-back from copilots and break the authority barrier of the captain. Similarly, the medical community struggles with flattening the hierarchy so that inputs from nurses and other non-physicians are valued and incorporated into the decision making process. Thus, other domains have faced similar cultural barriers to hierarchy and debate, and there are lessons to learn from how they have addressed the challenges. One of the lessons that can be drawn from experiences in other domains is that there is a need for an educational overhaul not just for current students, but also for educators and those with a longer history within the organization. It is not enough to teach those at lower levels in the organizational rank structure to question authority, without simultaneously helping those with more authority to understand the value of eliciting multiple perspectives and learn how to invite and encourage discourse.

Command-level Barriers

Interviewees also described a set of obstacles that pertain to Commander involvement , buy-in, and personal characteristics. These are described next.

Commander Involvement

Two-thirds of the interviews acknowledged that effective Design hinges heavily on the Commander's involvement and backing. Without Commander buy-in and sanction, Design isn't Design and trying to implement it can result in wasted effort. In the practical examples described by interviewees, the Commander's involvement was the make-or-break factor. For example,

> *Commanders may have allocated resources to Design efforts but, at the end of the day, they weren't involved. That was the key reason the Design efforts failed.* (Strategist; Instructor, CGSC)

A disengaged Commander is not privy to the dialogue, the logic, and the emergent insights of the Design activity. Design teams can spend hours, days, even weeks making sense of a problem space through iterative inquiry and discourse. When Commanders are not part of the team sensemaking process, they do not develop a shared understanding with the Design team. They become divorced from the logic behind the Design and may ultimately not give legitimacy to the outcomes that emerge. As interviewees noted,

> *The product of Design isn't as important as the journey. If all you do is brief the Commander at the end, they won't get the same level of understanding as if they went through it."* (Design Instructor, SAMS)

> *I've seen plenty of planning issues arise where the Commander either wasn't involved in the process or was involved only up front. When you don't have that engagement throughout the process, you can easily get sidetracked where you end up with a COA* [course of action] *you selected and figure out it doesn't work because the Commander is looking at it at the back end of the process.* (Operational Planner, SAMS graduate)

A planner from Afghanistan described a Design experience that fell flat due to lack of Commander involvement. The Design outcomes ultimately did not make their way into the plans.

> *Because the Commander wasn't involved, he totally missed out on the logic behind our efforts. He was totally disconnected. So it was hard to convince him at the end… Because he wasn't involved, it felt like we were wasting time. Spending time on solutions he wouldn't sign off on wasn't productive.* (Operational Planner, SAMS graduate)

Competing Demands and Lack of Understanding "What's in it for Me?"

Though the crucial role of the Commander in Design is clearly recognized, the number of duties and demands competing for the Commander's time and attention pose significant barriers to Commander involvement. As expressed by an interviewee who attempted Design while in Afghanistan as a planner:

> *I understood after awhile that the Commanders had no thinking time. Their schedules were so packed full with meetings…they really had no thinking time*

> *that I could detect. Their schedules were insane. To think they could find time to sit down and engage in Design efforts was unrealistic.* (Operational Planner, SAMS graduate)

Competing obligations and commitments are not the only reason for insufficient Commander involvement. Some Commanders simply do not see the value of Design, do not know what Design "looks like," or do not have a clear sense of when to use Design and how it can help them. Articulating the benefits of Design—the "what's in it for me?" - for the commander and the unit, and providing examples of how Design has helped Commanders would provide a valuable step toward addressing this challenge.

> *In order for doctrine to be adopted, better than half of the Army officers have to believe it will work for them…You need to go at it from a practical perspective and say, 'here's why it's good.'* (Operational Planner, SAMS graduate)

Moreover, in recognizing the investment required and the very real constraints on a Commander's time and attention, future research should identify the aspects or phases of Design where Commander involvement matters most. If the Commander cannot be involved in the whole process, are there critical points where his/her involvement would be vital? Are there cues, factors, or triggers that indicate to a Design team that they need to bring the Commander back into the Design activity? One interviewee who experienced Design as a planner in Afghanistan noted,

> *I would advocate the Commander should be involved in every step of the effort. But at least at various points as you struggle through things. Maybe get in-process reviews…offer some kind of communication.* (Operational Planner, SAMS graduate)

Required Skills and Characteristics

In addition to the time investment needed by Commanders, interviewees acknowledged that effective Design requires particular characteristics and interpersonal skills on the part of the Commander. Table 5 provides a categorization of command skills and characteristics identified by interviewees as necessary for Design. In some cases, interviewees described these characteristics as being unusual or atypical Commander traits, and not part of a typical Commander's cognitive and emotional make-up. As described by two interviewees:

> *It's so personality dependent. You have to be open to being wrong. You have to have an insatiable desire to learn more. You need to be inquisitive. My Commander was never happy with what he knew. And he wasn't uncomfortable being wrong. Those combinations allow you to learn more. These things are very rare in Army officers. We don't get promoted by admitting that we're wrong.* (Instructor, SAMS)

> *Design acknowledges that the commander isn't always right and not always the smartest guy in the room. And wherever you have the archetype Type A Brigade Commander, you're just not going to get it. It takes a supremely confident person*

to step back and learn new information. (Instructor, SAMS)

Table 5

Commander Characteristics Required for Design

Characteristic	Number of Comments	% of Total Comments Pertaining to Commander Characteristics
Humility; willingness to accept you do not know everything	8	26%
Open to feedback; willing to entertain input from subordinates	7	23%
Facilitative rather than autocratic	5	16%
Other/miscellaneous (e.g., professionally schooled)	4	13%
Open to being wrong	4	13%
Inquisitive; having a desire to learn more	3	10%

Given that some interviewees reflected on these characteristics as being atypical for Commanders, the Army may have a need to consider how Commanders are educated, selected, and incentivized so that Officers possessing these characteristics are retained and encouraged to display the characteristics. An important area for consideration is how the Army can develop, encourage, and reinforce these characteristics and skill sets so that they are more mainstream.

Application Barriers

The final set of barriers described in this report reflects challenges associated with the practical application of Design.

The Need for Structure vs. Maintaining the Spirit of Design

Applying Design theory and education to real-world operational settings is one of the challenges the Army faces in successfully integrating Design into operations. At the heart of this challenge is a tension that exists between two opposing camps: those who desire explicit Design procedures (e.g., a set of steps) vs. those who believe that providing such structure is counter to the philosophy and spirit of Design.

> *There is a reluctance—a danger—that Design might turn into another checklist. Some want to keep it more free-flowing and less structured, to encourage creative thinking. I agree. But that major in the field needs a heuristic, a tool. So there is a tension between these two things…keeping it non-structured, but giving people something to work with.* (Design Instructor, CGSC).

> *Some need that paint by numbers approach, otherwise they can't do it. And if you do that, isn't that defeating the purpose of Design? That tension is there.* (Instructor, CGSC)

Those who desire explicit Design procedures represent a perspective that believes the philosophical nature of Design does not resonate with most Army personnel and most Army

personnel are ill-equipped to apply the principles of Design without a guide, a series of steps to follow, or a set of tools and techniques to use. Codifying activities in this way is a standard practice in the Army, which has historically been process-oriented. The advantage of such an approach is that providing Commanders and staffs with something akin to a checklist reduces uncertainty. Checklists provide structure, reduce variability, and provide a common language and foundation for assessing execution of the desired activity.

In contrast, those who promote the philosophical approach to Design posit that Design, by nature, is inherently unbounded, emergent, and flexible. They argue that reducing Design to a set of steps is the direct antithesis of Design. When Design is proceduralized, it is no longer Design. Moreover, by sanctioning a particular methodology or set of steps, the Army makes an implicit assumption that there is one way to do Design; when in reality, Design may take many forms.

> *You cannot build a series of steps for Design no matter how hard you try because each Design approach is a new complex system. Each complex system is unique, with its own actors, own dynamics, own feedback loops. If you approach any new complex system with a predetermined process or predetermined end state, you're starting off on the wrong foot*. (Operational Planner, SAMS graduate)

The challenge is: What path should the Army take, given these opposing positions? It is possible that by addressing one view, it will only intensify the concerns of the other. But perhaps there is a middle point. One approach that may be beneficial is for the Army to acknowledge that there is no *one* process for Design, and that Design can in fact take many forms, follow different processes, and produce different outcomes. This variability can stem from a variety of factors including the problem space being studied, the timeframe available for Design, level of Commander involvement, and team composition.

It might be productive to provide a flexible framework for Design that focuses on common elements of Design (e.g., critical thinking, creative thinking, perspective taking, discourse), along with ways and circumstances in which Design can be useful, example questions to drive learning, example processes, and example products. The SAMS student text – "Art of Design" (SAMS, 2010) – provides a strong foundation for such a framework, incorporating example questions, example products, and example methods and tools for Design activity. The envisioned Design framework would provide structure to support the type of activity the Army is trying to promote, without dictating a specific set of steps to follow. Introducing a metaphor may also be helpful in this regard. Just as the script is not the play; the musical score is not the performance; the agenda is not the meeting—the Design framework is not Design. The framework is a structure that is open to interpretation and improvisation based on the unique set of circumstances and players involved.

Insufficient Examples and Evidence of Design's Utility

One third of the interviewees argued that Design has no proven track record, and that there are limited examples from the field that illustrate how Design has helped. Whether or not this is the case relates to issues around conceptual clarity, and disagreements about whether Design is actually new, as described earlier in this report. Some interviewees argue that one can find examples of Design throughout history, whereas others argue that Design is so new that there is

not a sufficient evidence base to reveal the value of this approach.

Given this disagreement, what may be most helpful is to refrain from posing Design as "all or nothing." The Army might focus instead on identifying and accumulating examples in which Commanders and planners employed particular elements of Design (critical thinking, discourse, innovation) to understand a complex problem space in a deeper and more nuanced way.

In addition to accumulating examples of Design in the field, articulating some of the potential benefits of Design to the Commander and his staff can help address this barrier. As one interviewee posited:

> *How does Design inform, relate to, and enhance any activities in the operations process? That's what people are struggling with. If it is going to make me better, great. If it is just a different way of saying the same thing, you're not helping me.* (Tactics Instructor, CGSC)

Table 6 describes some of the benefits of Design noted by members of the interviewee sample.

Table 6

Potential Benefits of Design

Benefits of Design
• *It helps you make sure you're solving the right problem. Otherwise you end up with lots of effort addressing the wrong problem.* (Instructor, SAMS)
• *This process helps Commander say: here's what I think the problem is. It can give the planning staff very good intent.* (Operational Planner, SAMS graduate)
• *It helps you to critically assess and improve.* (Operational Planner, SAMS graduate)
• *It provides an opportunity to start from the beginning with a clear ability to describe what the Commander wants and begin directing that to an operations plan.* (Operational Planner, SAMS graduate)
• *It gives good guidance. Good guidance makes planning more effective, which makes general operations run better.* (Instructor, SAMS)
• *Design helps bring conceptual and detailed planning together.* (SAMS fellow)
• *It provides clarity and unity of purpose for getting the plan done. You have everyone understanding what you're out to do. (Operational Planner, SAMS graduate)*
• *Just talking about complex issues helps you. Just talking about complex things gives you insights. You always benefit. You've advanced understanding somewhat.* (Participant, Unified Quest; Doctrine author, USMC)
• *If Design does anything it's challenging us to be more thoughtful in our thinking.* (Tactics Instructor, CGSC)

While these descriptions are valuable, Commanders and planning staffs also need evidence of Design's utility–or specific and concrete ways in which Design has had impact. For example, one interviewee described a situation in which using Design-type thinking helped him and his colleagues validate long-term assumptions and avoid wasting time on a non-critical path:

> *The Design process reaffirmed that we were actually heading in the right direction. It helped us better define the critical path that we needed to go down over the next several months in order to keep us moving towards transition. One of the biggest measures of our effectiveness was that we didn't have to dedicate so much time working on a solution to something that we determined wasn't critical at that time. Previously we had been spending a lot of time trying to work a*

> *problem which really ended up just being an academic exercise, when we should have been focusing on something else. We cannot afford inefficiency in our daily work. It's a colossal waste of time to dedicate so much time to something that just isn't a priority right now.* (Strategic planner, Joint Staff; SAMS graduate)

Accumulating concrete examples of the benefits Design has offered to those in the field will be helpful in supporting the Army's desire to integrate Design more fully into operations.

Practical Challenges

Finally, interviewees described a variety of practical implementation challenges that can pose barriers to successful execution of Design in the field. These challenges include:

- **Recognizing when Design might be appropriate**. Commanders and their staffs need to gauge the appropriateness of Design-type thinking within a given set of circumstances. This challenge pertains to recognizing factors, features, and characteristics of a situation indicating that Design-type thinking might be appropriate and valuable.
- **Determining the appropriate team composition**. Getting the right people in the group is key to effective Design. The challenge is determining who to bring to the table (both internal and external to the planning staff) and what factors one should consider in building a Design team.
- **Creating an open communication environment**. Design requires a level of trust between the Commander and his staff. The challenge is determining how to frame the task and create an atmosphere of trust and open communication that is conducive to discourse.
- **Determining how to "fit" Design within compressed timeframes**. Design requires an investment of time. The challenge is figuring out how to apply elements of Design to positive end, even when time is constrained in real-world planning cycles. What is clear from interviewees' examples is that Design is not an all or nothing activity. The opportunity to do some aspects of Design (e.g., discourse), while not a full-fledged and comprehensive Design effort, can still yield benefits.
- **Determining what to study and where to get information**. The complexity of social and geo-political issues means nearly every topic is connected and relevant in *some* way. Yet real-world constraints in time and personnel necessarily bound the Design activity. The difficulty is knowing where to start, how to prioritize the topics to invest time and energy into, and how to bound the inquiry.
- **Facilitating discourse**. Design involves management of team dynamics and the ability to draw out productive discourse. The challenge is determining what questions to ask to stimulate creative and critical thinking, and how to guide the discussion without bounding it.
- **Developing metrics and testing assumptions**. Design involves questioning assumptions and developing deeper insights. The challenge is how to develop metrics or indicators that can enable the team to detect that an assumption should be modified or discarded.
- **Capturing, representing, and disseminating insights**. The discourse involved in Design is iterative and emergent. How does the team capture the learning that takes place and the logic behind the insights and understanding developed? And when and how

should they communicate the insights in a way that captures key connections in the stream of logic?

To realize the potential benefits of Design, Commanders and other Design leaders need guidance on how to navigate these challenges as they try to apply Design in real-world settings. As part of this research, the authors have developed a prototype Design resource to provide this support to Commanders and Design leaders. The resource (ADM Commander's Resource, U.S. Army Research Institute, RP 2012-01) describes some of these challenges, provides examples of how they manifest in real-world operational environments, and gives tips, strategies, and guidance for how to manage them.

DISCUSSION AND RECOMMENDATIONS

This research effort has produced a rich data set that speaks to a variety of obstacles the Army faces as it attempts to infuse Design into Army operations. The authors have identified and described a number of barriers the Army faces as it engages in this organizational change.

Suggestions and recommendations for addressing the barriers have been included in relevant sections throughout the report. Recommendations were informed by the nature of the problems identified, as well as consideration of Kotter's (1996) and Rogers' (1995) theories of organizational change and diffusion of innovations. In this section, the suggestions and recommendations are compiled and organized around the following central themes:

- Promoting Design within the Army
- Accumulating an Evidence Base
- Education/Instruction in Design
- Incentives/Rewards
- Facilitating the Link to Practice
- Future Research

Promoting Design within the Army

As the Army moves forward with Design, the ways in which key elements of Design are communicated will be critically important, particularly in light of early, less-than-successful efforts to introduce Design to the operational community. Recommendations include the following:

- **Provide the Purpose for Design** in a definitive, focused, operationally relevant statement of the problems that Design is intended to address, as well as its relative advantage over previous practices. Institutionalize the problem statement so that it is conveyed as a consistent message associated with Design.
- **Identify areas of convergence** in the ongoing dialogue about Design, while acknowledging the controversy and debate that surround Design. Emphasize areas of common ground and build on them.
- **Focus communications about Design on the utility and application of Design**, rather than its conceptual lineage. Provide Commanders and planning staffs with answers to the

question: “what’s in it for me?” Make a consistent distinction between the conceptual, theoretical dialogue about Design and the exchange of ideas and experiences that pertain to its real-world application.

- **Address uncertainty about how Design fits within the operations process**. Provide a consistent, clear message regarding the relationship between Design and planning. The message should include specific description of the various ways that Design can feed detailed planning.
- **Address perceptions that Design is incompatible with the Army’s hierarchy**. Communicate how Design is congruent with traditional command structure: Design occurs at the behest of the Commander, requires the Commander’s input, and provides information and insight that is responsive to the Commander’s needs.
- **Convey clear, consistent messages regarding the criticality of Commander Involvement**: why it matters, what Commanders can expect to gain, and what they risk by failure to engage in Design activities.
- **Communicate that there is no single way to apply Design.** It can take many forms, follow a variety of processes, and produce a range of outcomes. Emphasize the key elements that underlie Design, including critical thinking, discourse, holistic thinking, questioning of assumptions, and adoption of alternative perspectives.

Accumulating an Evidence Base

Findings from this project suggest that one of the barriers to acceptance of Design is insufficient information about the benefits Design can provide, and/or how to incorporate Design practice into ongoing operations. Offering concrete, specific examples that reflect real-world issues and problems will provide a collective experience-base that Army Commanders and planning staffs can turn to for guidance. Recommendations on this topic include:

- **Develop an incident base** that both illustrates the efficacy of Design and provides specific, detailed examples of strategies and processes for conducting Design. How are successful Commanders and planners doing this? What are the circumstances in which they use Design? What ranges of strategies are employed? What outcomes and products stem from the process, and how do they feed detailed planning?
- **Document the value that Design provides** by articulating the ways and circumstances in which Design has been helpful in real-world circumstances. This will help Commanders and planning staffs know what they might expect to gain by engaging in Design.

Education/Instruction in Design

The amount of variability that currently exists in education about and instruction in Design presents a number of difficulties. Possible ways to address the barriers linked to current educational practice are:

- **Reach agreement on a central set of learning objectives** for Design instruction, and apply them consistently in the classroom.
- **Develop a set of assessment criteria for the key cognitive and interpersonal skills** that Design calls for, in order to develop and assess these component skills.

- **Identify the set of instructional practices** that are both most useful for teaching Design and consistent with the Army's position and message regarding Design.
- **Embed principles of Design throughout Professional Military Education (PME).** The habits-of-mind that underlie effective Design (e.g., critical thinking, creative thinking, systems thinking) should be fostered and reinforced throughout the PME curriculum so that they become internalized, rather than treated as a discrete set of Design-relevant skills in a course on Design.
- **Provide opportunities to practice on real-world problems**, and in particular, on local problems that will provide opportunity for students to observe and possibly act on complex, dynamic environments from a Design perceptive.
- **Provide opportunities for students to develop an awareness of different cognitive styles** (their own and others). Being able to adopt a different way of thinking requires understanding one's current ways of thinking. In addition, provide opportunities to practice adapting their approach to solve different types of problems.
- **Identify and train a cadre to model Design** and invite staffs to watch the cadre model a Design approach to a complex problem. Alternatively, videotape one or more Design sessions modeling the approach, illustrating the value and benefits, and make the video available on SAMS or other websites for viewing.

Incentives/Rewards

Current Army reward mechanisms may not consistently encourage and reward the thinking and approach to understanding problems that characterize Design. For Design-type thinking to take root, the Army should establish mechanisms that will encourage and reinforce the type of behaviors and thinking that characterizes Design. Recommendations are:

- **Examine the behaviors, cognitive styles, and problem solving approaches that are currently encouraged and rewarded**, both implicitly and explicitly. Identify whether the types of behaviors and cognitive activities that support robust Design are encouraged or stifled.
- **Generate incentives and rewards** that foster the activities and behaviors necessary for Design and apply them consistently across the force. Showcase and reward "small wins" or early examples of Design application in the field.
- **Draw on lessons-learned from other domains** that have faced similar cultural barriers to hierarchy and discourse, such as the airline industry and the healthcare industry. Identify ways in which these industries have fostered the types of activities that characterize Design.

Facilitating the Link to Practice

Applying Design theory and education to real-world operational settings is a major challenge the Army faces to integrate Design into operations. For many in the Army, it is not obvious what to do or how to do it in order to harness the potential of Design. Support for the transition from Design classroom to operational setting and from theory to real-world application is a key element of overcoming barriers to Design. Recommendations on this topic include:

- **Help Commanders and planning staff anticipate the practical challenges** they are likely to encounter; provide guidance and examples for how to navigate the practical challenges of Design in the real world.
- **Avoid over-proceduralization. Rather than a checklist, provide a flexible framework for Design** that a) emphasizes common elements of Design (e.g., critical thinking, creative thinking, reflective practice, perspective taking, and discourse) and b) provides example questions to drive learning, example processes, and example products. The framework would provide a structure to support the types of activities the Army is trying to promote, without dictating a specific set of steps to follow, or reducing Design to a checklist.
- **Provide indicators and examples for how to recognize** when Design might be appropriate and useful, based on specific examples of Design usage in real-world operations.
- **Provide tools and strategies for facilitating discourse** given its important role in effective Design. Currently, this skill component is not an explicit part of the educational curriculum.
- **Provide tools and examples for how to capture, represent, and communicate insights** gained during Design sessions.
- **Package practical tips and strategies** in a convenient, readable, and non-academic manner for Commanders and planning staff.

Future Research

The interview data also suggest several areas where additional inquiry could support the Army's efforts to remove barriers to Design. For example:

- The data present a compelling case for Commander involvement in Design while also indicating how impractical it is to expect Commanders to engage fully in Design. Given that, it will be important to identify those points in the Design process where Commander involvement is most critical, and likely to have the greatest impact.
- There are widely divergent views on the echelon level at which Design should happen. An important question is, "What is the intersection between people's views on what Design is and their understanding of how and when it is applied?" We anticipate that understanding this intersection will be an important component in the Army's efforts to link theory to practice.
- Building a set of case studies and/or examples that illustrate different aspects of Design, how they are used, and what impact they have is a key component to fostering engagement with Design across the operational community, particularly given that people learn through stories. Appendix B provides a beginning to that set of examples, but there is a need for a broader set of examples.
- A few interview participants suggested that there may be cultural differences in how readily and/or ably people engage in Design. For example, two interviewees spontaneously mentioned that British and Australian military planners are viewed as better at Design than U.S. military planners. Two interviewees made similar comments about U.S. Army Special Forces, suggesting that Design-type thinking is generally more embedded within the Special Forces culture. These data raise two questions. First, are

there systematic national- or organizational-culture differences? Second, if there are, how might we account for those differences? Understanding the sources of such systematic effects may provide the Army with additional ways to address barriers and facilitate the integration of Design.

Conclusions

This report describes findings from an in-depth qualitative study of the barriers and challenges the U.S. Army faces in its efforts to integrate Design into ongoing operational practice. Findings from the research indicate a variety of obstacles to successful integration of Design into operations. While the barriers are significant, they are not insurmountable. Early missteps in promoting Design have been acknowledged, and there are already specific changes and activities in place (such as revisions to doctrine and development of practical guidance) that have the potential to foster adoption of Design across the Army. Attention to the existing barriers and the recommendations for addressing them can support the Army's efforts in making Design an integral part of operations.

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APPENDIX A
LITERATURE REVIEW

Overview

With the writing of FM 5-0: *The Operations Process*, the Army formally incorporated Design into doctrine. Though many argue that successful Commanders have been doing Design for centuries, the codification of Design in doctrine nonetheless represents a new initiative for the Army. When an organization initiates change, it can face a variety of obstacles that have the potential to hamper the effectiveness of the organizational change effort.

The purpose of this literature review is to complement the data collection efforts undertaken to identify significant factors that may prevent successful incorporation of Design into Army operations. In addition to providing the research team with an orientation to the concept of Design and its introduction into the Army, the specific goals of this literature review included the following:

1) To provide an overview of Design and its introduction into the U.S. Army
2) To describe the recent debate on Design and documented obstacles to implementing Design across the force.
3) To identify theories of organizational change that can be leveraged to guide the Army in overcoming barriers and facilitating the assimilation of Design into its operations process.

Important to note is that several of the topics described in this literature review are covered in the body of the research report. For example, many of the challenges of Design covered in this review overlap with the set of barriers identified through data collection. This is not surprising given that some interview participants have published articles or written blog posts on barriers to Design, resulting in similar topics being reflected in the interview data and in the literature. The research team intentionally interviewed individuals who had published on the topic in order to understand the challenges they noted at a finer level of detail. We also chose to maintain the redundancy so that this literature review could stand alone as a synthesis of the literature on Design and the barriers that had been previously documented.

The literature examined within this review includes Army and Joint doctrine (including FM 5-0, FM 5-2, TRADOC Pamphlet 525-5-500), and a variety of military publications such as articles in *Military Review*, *Small Wars Journal*, and the *Marine Corps Gazette*. The research team also examined business management and organizational development literature for theories of organizational change. In addition to the formal literature, the researchers examined writings in the blogosphere, including posts on the Combined Arms Center (CAC) blog. These blogs provided unique insight into the ongoing debate surrounding the introduction of Design.

This literature review is organized into three main sections:

- Section I: Background—Design and its purpose
- Section II: Current Debate on Design
- Section III: Factors that Impact Effectiveness of Change Initiatives

Section I. Background

In contemporary operating environments, military forces face increasingly complex, dynamic, and multifaceted challenges (Mattis, 2009; TRADOC, 2008; USJFCOM, 2010). Commanders and their staffs face a range of demands and operational missions that extend beyond conventional warfare between states to irregular warfare, where political, social, cultural, and military activities intermingle (TRADOC, 2008). As Schmitt (2006) describes, the problems that characterize the contemporary operating environment are fundamentally social problems, comprising human beings who are interacting in a variety of ways, according to various motivations. Because these problems are the outcome of human will, intellect, and creativity, they are essentially unknowable; no amount of information collection or analysis will reveal objective truth or provide the ability to predict future events with certainty. Further, these situations typically surpass any one individual's ability to grasp, much less resolve (Schmitt, 2006).

The range and complexity of problems the Army faces has drawn attention to the role and adequacy of traditional military planning processes. Military leaders have questioned whether the Army's standard doctrinal procedures are sufficient for responding to the emerging challenges in current operational environments that are marked by volatility, uncertainty, complexity, and ambiguity (Mattis, 2009; Paparone & Topic, 2010). "Commanders at all levels today face highly complex, dynamic and novel problem situations which they are called on to resolve, but for which the known and practiced solutions of doctrine will not suffice" (Schmitt, 2006, p. 1).

While traditional approaches have served the military well, the approaches of reductionism and analysis are arguably not as useful within the interactively complex systems in which forces operate, as they do not address the interaction between components (TRADOC Pam 525-5-500, 2008). Some have argued that due to over-proceduralization, current doctrinal practices limit the critical and creative thinking necessary to react and be agile to adaptive adversaries (Mattis, 2009; TRADOC Pam 525-5-500, 2008). "The study of interactively complex systems must be systemic, rather than reductionist, and qualitative rather than quantitative, and must use different heuristic approaches rather than analytic problem solving." (TRADOC, 2008, p. 6). In other words, Commanders must approach operational problems from a holistic perspective.

The recognition of deficiencies in the practiced and traditional military planning methods has underscored the need to consider alternative approaches to operational planning that will enable units to adapt to agile adversaries and affect change within complex, dynamic environments. According to Wass de Czege (2009), the ubiquity of complexity facing the military necessitates a different form of thinking: "Where merely complicated systems require mostly deduction and analysis (formal logic of breaking into parts), complexity requires inductive and abductive reasoning for diagnostics and synthesis (the informal logic of making new wholes of parts)," which in turn "implies a new intellectual culture that balances Design and planning while

evincing an appreciation for the dynamic flow of human factors and a bias toward perpetual learning and adapting" (Wass de Czege, 2009, p. 3).

To respond to these challenges and address the call for a new conceptual approach to managing the complexities of today's operational environments, Design was introduced into the U.S. military. The concept of Design was based largely on influence of Israeli Brigadier General (retired) Shimon Naveh's concept of Systemic Operational Design (SOD) (Elkus et al., 2010; Naveh, 1997). Naveh's concepts were introduced in the U.S. through a series of exercises conducted by the Concept Development & Experimentation Directorate of the U.S. Army Training and Doctrine Command (TRADOC) starting in 2004, including *Unified Quest* 2005 and 2006. The School of Advanced Military Studies (SAMS) has played a pivotal role in experimenting with and evolving Naveh's concept over the last several years. While elements of Naveh's SOD remain, the Army created its unique version of Design and officially introduced it into doctrine in 2010 in FM 5-0.

What is Design?

Design has been defined and described in myriad ways across a variety of sources, and the concept continues to evolve (Elkus et al., 2010). In most recently published doctrine, Design is defined as "a methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them" (Headquarters; Department of the Army, 2010, pp. 3-1). Fundamentally, Design is intended to help Commanders adapt and respond to highly complex, dynamic, and novel situations. Design is a cognitive approach that enables Commanders to develop a deeper understanding of unique situations in order to visualize and generate change in that environment. In essence, "Design gets one to a better description of complex environments and possible ways to approach these environments" (Paparone, 2011).

One of the distinguishing factors of Design is its departure from the analytic-reductionist mindsets that characterize conventional doctrinal planning processes. Zweibelson (2011) describes this distinction. He argues that while conventional linear-reductionist perspectives ask the question 'what' and pursue description, Design asks the question of 'why' and seeks holistic explanation. "Design seeks explanation instead of description, and looks at systems holistically instead of reducing the world down into chunks" (Zwiebelson, 2011, p. 18).

Some have argued that Design is roughly akin to conceptual planning as described in doctrine; however, there are some nuances. As described by Schmitt (2006), conceptual planning is a process of creative synthesis supported by analysis. It generally corresponds to the *art* of war. Schmitt argues that while Design possesses those same characteristics, it "includes an even more fundamental inquiry into the nature, factors and dynamics of the problem situation which should inform the initial establishment of aims, objectives and intentions and the development of broad concepts of action" (Schmitt, 2006, p. 6).

Types of Problems Design is Intended to Address

Design has been described as intended for use with a particular class of problems: those that are ill-defined, complex, or "wicked" as coined by Rittel and Weber (1973). These problems involve

predicting social behavior, which is inherently complex as it involves countless interactions among stakeholders with a variety of motivations (Grigsby et al., 2011; Schmitt, 2006). For wicked problems, there is no definitive way to formulate the problem; it can be formulated in a variety of ways by a variety of stakeholders. And there is no objective measure of success in dealing with them (Conklin, 2005; Schmitt, 2006). These are the types of problems that many argue typify the contemporary operational environment. Conklin (2005) and Schmitt (2006) contrast wicked problems with "tame" problems. While tame problems may be challenging, they are different from wicked problems in that they are sufficiently understood or they lend themselves to existing methods or solutions. Solving ill-defined or wicked problems requires both a conceptual and detailed component of planning; and Design provides a tool for the conceptual component.

Design as Team Sensemaking

Conceptually, Design is a sensemaking process. Klein, Phillips, Rall, and Peluso (2009) define sensemaking as "the attempt to understand events that have occurred and anticipate what might happen next. [Sensemaking] looks back to sort out the past and forward to prepare for the future." (p. 177). Team sensemaking, specifically, is "the process by which a team manages and coordinates its efforts to explain the current situation and to anticipate future situations, typically under uncertain or ambiguous conditions" (Klein et al., 2010, p. 304). The outcome of a successful team sensemaking process is a shared understanding of a situation; at this point, the appropriate course of action is apparent (Klein et al., 2010). Much like team sensemaking, Design is a process for explaining and anticipating through the social construction of knowledge (U.S. Army School of Advanced Military Studies [SAMS], 2010). Design is an iterative process that enables a team to identify appropriate courses of action and adjust those actions as new data changes their understanding of the situation.

A fundamental feature of Design that supports team sensemaking is discourse between Commanders and staffs, and across levels of command. As described in JFCOM's Vision for a Joint Approach to Operational Design (Mattis, 2009), discourse across the Design group is meant to test arguments about the nature of the actors, interest groups and relationships, in order to create a system frame. It is meant to encourage subordinate Commanders to aggressively share their perspectives with superiors, challenge assumptions, and resolve differences at the earliest opportunity. Based on the shared understanding of the systems frame, the group then creates a mental model of the desired state of the system.

A Methodology for Design

With the introduction of Design into FM 5-0, The Army offered a methodology for creating a shared understanding of a problem space and an approach to solving it. The methodology contains three elements that reflect an approach to organizational learning that ultimately leads to a Design concept to guide detailed planning. The three elements include: Framing the operational environment (asking: what is the context in which the Design will be applied), framing the problem (identifying the problem that needs to be solved), and considering operational approaches (what general approach can be applied to solve the problem). The relationship between these elements was introduced in Banach et al. (2009, p. 144) and included in FM 5-0 (Headquarters; Department of the Army, 2010). This representation of Design methodology

highlights the degree to which Design is an iterative process in which thinking is informed by and adapted between elements of the situation at hand and possible solutions to develop a "Design concept."

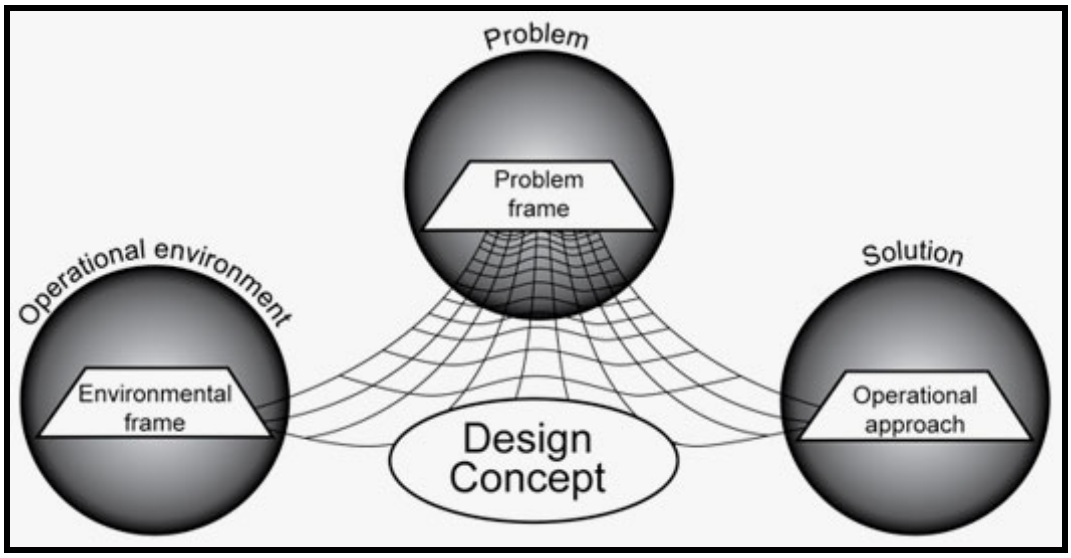

Figure A-1. "The Art of Design: A Design Methodology," graphic, The Three Design Spaces (Banach et al., 2009).

Relationship of Design to Planning

As described by Mattis (2009), Design and planning are interconnected. Planning is incomplete without careful thinking; it can lead to sub-optimal results or a misapplied focus on solving the wrong problem. Banach et al. (2009) acknowledge the importance of articulating the link between Design and planning. Grigsby et al. (2011) and FM 5-0 describe the link between Design and planning by positing that effective planning has two closely related components—a conceptual and a detailed component. They contend that the Design methodology offers Commanders and staffs a set of tools for the conceptual component. Grigsby et al. (2011) caution that planning and Design should not be considered as separate. Rather, Design is part of the planning process, in addition to other established elements including the Military Decision Making Process (MDMP) and Troop Leading Procedures—all of which are part of the larger operations process.

To illustrate the connection between Design and planning, Schmitt (2006) places the two on a continuum (see Figure A-2). He suggests that while Design can be thought of as problem setting, planning can be thought of as problem-solving. Design focuses on learning about the nature of the problem, whereas planning focuses on generating executable actions for addressing the problem. The ends of the continuum require cognitively different types of work, but Design and planning merge at a point where a course of action (COA) is conceived.

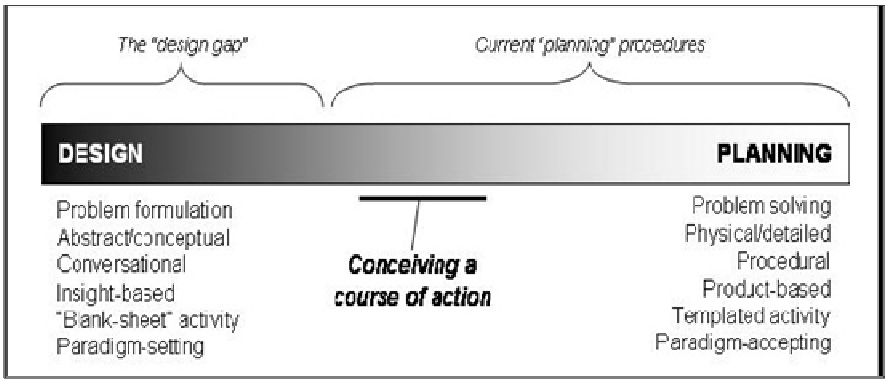

Figure A-2. The Design-Planning Continuum (Schmitt, 2006, p. 7).

Summary

To summarize, while the literature contains a multitude of definitions and descriptions of Design, there is some degree of consistency around central features of Design. The characteristics of Design described consistently across the literature include the following:

- Design involves critical and creative thinking to develop a holistic understanding of interactively complex problem spaces.
- Design is an iterative process, involving reflection and continuous learning.
- Design involves the social construction of knowledge and understanding, by bringing multiple perspectives to bear.
- Design employs discourse in order to reach a shared understanding of the problem.
- Design provides a basis for detailed planning and action, which in turn help to inform additional learning and adaptation.

Section II. The Current Debate on Design

While the acknowledgement of previous doctrinal weakness is consistent across the literature, introducing the concept of Design into the Army has not been without dispute. Both prior to and following the official introduction of Design into doctrine, significant discourse emerged on the topic within the blogosphere and military publications, including the *Small Wars Journal*. The next section in this report summarizes the key arguments in the debate surrounding Design that may pose barriers to successful incorporation of Design across the force.

A Clear Need for Design Has Not Been Established

As noted by Tippett (2009) "In order to generate meaningful change in an organization there must be at some level a perception that change is required and that what is being offered is in some way better than the status quo" (p.14). Literature pertaining to Design indicates that this perception might not currently exist in the Army. One of the questions that emerged in the debate surrounding Design is: What gap is Design filling? Or, what problem is it trying to solve? While literature on Design describes it as a means for dealing with complex and ill-structured circumstances or Volatile, Uncertain, Complex, and Ambiguous (VUCA) situations (Paparone et

al., 2010), some find that this argument insufficient. Some authors question whether operations are truly more complex today than in the past, or whether the military has in fact always faced such complexity (e.g., Burke, 2010; Tippett, 2009). As posed by Vohr (2009): "The dystopian view of the future operational environment characterizes it as complex. As a human interaction, is it significantly more complex today than in the past?" (p. 13). Similarly, Elkus and Burke (Elkus et al., 2010) noted: "the claim that present conflicts are worlds more complex than those of the past is not supported by the historical record. The present environment is not more complex, nor was the past environment simple." (Elkus et al., 2010, p. 5).

Related to these arguments is the question surrounding whether Design is, in fact, new. Some describe it as a novel way of thinking and making sense of the world: e.g., "Design provides a novel logic or series of logics for making sense of complex problems, after which relevant detailed planning logic can orchestrate immediate action to support" (Zwiebelson, 2011, p. 19). Yet while some might tout Design as a new way of thinking, others contend that it is not. Confusion has come about in part due to the way in which concepts of Design have evolved over time, specifically in relation to existing doctrinal ideas. Some argue that Design is already part of mission analysis that precedes detailed planning if done properly: "Properly executed, our current mission analysis Joint Operations Planning Process (JOPP) step should not be mindless and should already incorporate significant, structured discourse (Vohr, 2009, p. 13). Similarly noted by Zweibelson (2011), "Many military professionals charge that *Design* is just MDMP's mission analysis on steroids" (p. 1).

Nocks (2010) adds a relevant concern that Design—as described—is closely aligned to existing approaches to problem solving within Battle Command. He cautions that the military may be heading down a path similar to Effects Based Operations (EBO), and suggests that instead of formalizing the Design process, that amplifying Battle Command and its relationship to the operational process might better serve the intent associated with introducing Design.

Design is Too Difficult/Too Complex

As the Army introduced Design, it has left some with an impression that only the "elite" few can do it. At the root of this argument is the perception that the methodology and language of Design are too complex and that Professional Military Education (PME) does not currently prepare officers to take to Design intuitively (Burke, 2010). McLamb (2011) alludes to the perception that "Design is for 'smart guys' while the MDMP is 'what the nugs do'." Further, Yingling (2011) argues that Design requires a unique skillset. It requires systemic thinking, which is a departure from the cognitive approaches taught as part of Professional Military Education (Canon, 2009) or within the U.S. education system more broadly (Senge, 2006). As noted by Tippett (2009), "Systems theory and nonlinearity [which are aspects of Design] are complicated subjects that require a significant investment of study before the 'light bulb comes on'." (p. 15). Given the emphasis on rational/analytic approaches to thinking in traditional education, the cognitive approach required for Design is less comfortable. Armed forces are "more comfortable initiating planning with a defined statement of what needs to be accomplished rather than a more vague 'desired state'." (Burke, 2010, p. 16).

Grigsby et al. (2011) acknowledge and attempt to dispel the myth that Design methodology is only for the talented few. They admit that a false image has been perpetuated, which reflects a

group of Designers helping a Commander do conceptual thinking and then passing the product off to the less-talented planners to figure out the details. They reiterate that planners must develop skill in both conceptual *and* detailed thinking, and that detailed constraints must inform and bound conceptual planning.

Design Lexicon is Ambiguous, Inconsistent, and Overly Complex

Related to the notion that Design is too complex, the literature contains a variety of criticisms surrounding the language associated with Design. Criticisms have centered on the lexicon being inconsistent, ambiguous, imprecise, and elitist. One concern stems from the reality that Design concepts and lexicon have been evolving since its introduction to the Army (Banach et al., 2009). The proliferation of writings on the subject, with the divergence in terminology, has been a source of confusion and has contributed to lack of conceptual clarity (Nocks, 2010).

A common criticism waged against Design is reflected by Banach et al. (2009, p. 107) who note that a major "stumbling block in moving Design forward has been an inability to define terms and use ordinary language." Design literature has been described as dense and laden with philosophical jargon (Canon, 2009) that is inaccessible to the masses. "I found most of what was written about Design to be poorly articulated, unnecessarily complicated, and generally infused with a preference for vague and uncommon terminology over clear and concise language" noted McLamb (2011). Similarly, Burke (2010) argues, "First and foremost, operational Design expertise is seen as specialist knowledge. It has developed a language of its own with which Commanders and staff may be unfamiliar. Acronyms abound. Even within planning circles, some aspects of emerging Design methodologies involve difficult concepts that are not intuitive. These institutional hurdles will need to be overcome if Design is to truly develop" (Burke, 2010, p. 24).

An alternative viewpoint is that Design necessitates its own unique lexicon, and that Design terms should not be conflated with existing planning terminology. Representing the latter view is Zweibelson (2011) who argues that imprecise vocabulary used throughout FM 5-0 Chapter 3 is problematic. He argues that Design requires unique vocabulary to distinguish it, and that using military terms and phrases interchangeably inhibits understanding of Design. He suggests avoidance of words such as 'problem' and 'end state', which are traditionally associated with detailed military planning. Paparone (2011) reflects a similar perspective and notes that doctrine writers were under pressure to "dumb down" Design doctrine to increase the likelihood of buy-in from the rank and file. He noted that doctrine writers used lexicon the force was already familiar with—such as lines of effort, end-states, and centers of gravity rather than a unique set of vocabulary—and he sees this as problematic.

Despite this viewpoint, the overwhelming perspective in the literature is that the language and terminology surrounding Design is overly complex. Based on this recognition, Banach et al. (2009) acknowledge that an effort is underway to simplify the language of Design to improve accessibility to the field.

Design is Incompatible with Military Culture

Thought leaders on Design have cautioned that Design may be incompatible with certain elements of military culture. Col (Ret) Paparone notes several levels of incompatibility between Design and military culture. At a core level, he argues that Design is inconsistent with existing philosophical paradigms in the Army. Specifically, he argues that there is an inconsistency between positivist philosophy that characterizes the traditional approach and the military culture more broadly, and post-positivism that characterizes Design. He argues that the military culture is steeped in a programmatic and rational-analytic approach to problem solving, which is the antithesis of Design (Paparone, 2010a). He argues that the military curriculum is focused on the "what"—or context-free knowledge, rather than context-rich reflective practice, which Design espouses.

Tippett (2009) supports this view by arguing that military as an institution operates within a linear paradigm "…our military as an institution has operated in a paradigm of linearity since its inception" (p. 20), which is counter to the spirit of Design. Zweibelson (2011) further describes Design as offering a different system of logic for making sense of the world—one that provides a holistic and innovative perspective; while currently leadership focuses on a conventional linear, reductionist perspective. McLamb notes, "While the Military Decision Making Process (MDMP) and the Joint Operation Planning and Execution System (JOPES) allow for synthetic thinking, they place much greater emphasis on analytic thinking, breaking a problem into its smaller components in order to gain understanding. This is in sharp contrast with Design's emphasis on considering systems as entire complex entities" (McLamb, 2011).

Some also argue that Design may be incompatible with the military culture of hierarchy and leadership. Canon (2009) suggests that the uninhibited conversation and integration of ideas across those on the Design team is inconsistent with the social conditioning of military planners within a culture of hierarchy. Similarly, the SAMS student text (U.S. Army School of Advanced Military Studies [SAMS], 2010) notes that Design is "inherently participative and pluralistic," and that it "challenges the dominant model of power leadership" (p. 20). Paparone (2011) frames this challenge as an inconsistency between Design and the traditional hierarchical culture and "ethic of compliance" in the Army. Specifically, he noted: "Institutional dissention is important to reflective practice and Design ethics; yet, it remains in conflict with institutional norms" (Paparone, 2011, p. 6). He argues that within the practice of military Design science, there should be a shift toward post-positivist forms of knowledge construction "where rank and institutional authority associated with command and management should be left at the door and where Commanders and senior ranking managers become first among equals" (Paparone, 2010b, p. 8).

Also relevant to cultural incompatibility is the theme of anti-intellectualism in the Army. As Paparone (2011) noted, "there seems to be a very negative view in the upper tiers of our military's leadership toward military officers' ability to grasp complex topics." This has contributed to a "dumbing down" of concepts and doctrine to be broadly accessible to the masses. But as Martin (2011) noted, "The Army has a lot more talent than it all too often seems to realize."

The Instantiation of Design in Doctrine Dampens the Spirit of Design

Doctrine by its nature tends to be prescriptive and process-focused. But Design by its nature has a non-prescriptive, amorphous, and unstructured character. In fact, it has been described as an "art" by many, as opposed to a method or process (U.S. Army School of Advanced Military Studies [SAMS], 2010). Due to this apparent incompatibility, some have argued that describing Design in doctrine has reduced it to a step-by-step mechanistic process. By describing Design in this way in doctrine, it loses its "creative mystique" and the Army risks defaulting to a checklist, which is one of the main critiques of MDMP (Vohr, 2009).

Further, some have argued that doctrine was over-simplified to make it more accessible to masses (Paparone, 2011). By making certain compromises in the way it is described, doctrine writers may have diluted the concept to the point where it is no longer useful (Martin, 2011; White, 2011). Aptly noted by Jones in blog (Jones, 2010), "Doctrine is to planning and fighting like recipes are to cooking, or paint-by-number is to art. It's a good way to ensure that virtually anybody can come up with a decent product (as rigidly defined by that same doctrine), but it sure constrains the hell out of your artists."

How Design Fits Within the Operations Process Has Not Been Clearly Articulated

A common theme in the debate surrounding Design and its introduction into the Army is that existing doctrine has failed to provide a clear sense of how Design fits with existing doctrinal planning processes and other aspects of the operations process (Burke, 2010; Vego, 2009). This perception appears to be largely driven by the stand-alone chapter on Design in FM 5-0 that gives the impression of Design as an independent component, rather than an integral part of the larger operations process. According to Watson (2010), this apparent separation between Design and existing doctrinal planning processes contradicts one of the fundamental elements required for organizational learning—receiving feedback. As Watson (2010) noted, "Until we act and cause a complex system to react to our inputs, we cannot know if we are…'doing the right thing' or 'doing things right.'" Thus Design and MDMP cannot be separate processes.

Acknowledging this issue, Banach et al. (2009), noted: "For Design to be useful in the military domain, it must complement and interact with existing planning doctrine. This means the interface between Design and planning needs to be clearly specified" (p. 106). Grigsby et al. (2011) also acknowledge this concern as one of the myths surrounding Design that has been perpetuated in the last few years. The myth is that Design methodology and planning are mutually exclusive when in fact, they are not. The authors contend that Design methodology is a component of planning, along with MDMP and Troop Leading Procedures. In addition, all of these components are part of the Operations Process. Thinking of Design and planning as two distinct components is flawed and only creates confusion. This is consistent with Mattis's (2009) *Vision for a Joint Approach to Operational Design* that suggests that planning is not complete without Design. Further, Grigsby et al. (2011) suggest that getting the most utility from Design requires that doctrine incorporates conceptual tools of Design methodology with the best detailed planning tools of MDMP.

Related to this issue is a concern that there is limited description of how to practically incorporate Design into detailed planning. As noted by Yingling (2011) in a blog post following

Zweibelson's (2011) analysis of the Mexican Drug Cartel problem, "I have not seen a single example of going from conceptual to detailed that is understandable to the masses—until now." This comment reflects a sentiment that Design has suffered from ample theory, but limited practical guidance. While theory abounds, some argue that there is minimal detail available for implementing Design—both within the Army and across the services (Martin, 2011).There is limited guidance on how to use Design in practice—specifically within time-pressured contexts in which conceptualization, detailed planning and orders production must occur on a compressed timeline.

There is Limited Evidence that Design Works

As noted by Grigsby et al. (2011): "the advantages that the Design methodology offer will go largely unrealized unless the force is convinced of its value" (p. 29). Additionally, as echoed by Marr (2010), "until Design can be tested and refined through the crucible of application by operational units…the debate between professionals (alone) is not worth much.". Both of these comments are indicative of another key hurdle in the integration of Design within the Army, which is the perception that there is little evidence of Design's utility (Burke, 2010).

To the contrary, some have argued that the evidence we do have fails to offer support for Design's utility. Vego (2009) argued that Design failed when used by Israeli Defense Forces in 2006. Related to this notion is the argument that Design has been oversold as a panacea (Grigsby et al., 2011). In his blog post on the Combined Arms Center Blog, McLamb (2011) described a conversation with an Israeli who described the 2006 war in Lebanon. The officer acknowledged that Israeli officers had come to believe that Design would lead to "a level of operational understanding that would eliminate the guesswork that marks the application of military power. Playing much the same role as the Sirens in Homer's *Odyssey*, Design distracted the military from the problem at hand by promising to reveal the Truth if given adequate time. While chasing this dream of unadulterated truth, the crew is drawn away from the need to navigate the boat, to row, to act (McLamb, 2011, "The Danger of Design," para. 3)." McLamb makes the point that Design does not eliminate uncertainty and that "the idea that Design can provide perfect understanding is dangerous to a force that must operate under the pervasive uncertainty of military operations (McLamb, 2011, "The Danger of Design," para. 3)."

Regardless of how it has been "sold" to the Army, part of the challenge pertaining to accumulating evidence of Design's utility is the difficulty in assessing effects for non-kinetic solutions. As Schmitt (2006) noted, "*There is no immediate and no ultimate test of a solution to a wicked problem.*" There are no objective means to determine the correctness of a solution, and various stakeholders will assess the quality of a solution differently based on their own individual perspectives. Though this is not a new problem in planning circles, it complicates the accumulation of an evidence base nonetheless.

SECTION III: Organizational Change: Factors That Impact Effectiveness of Change Initiatives

While many contend that Design is nothing new, and that one can identify examples of Design throughout military history, the introduction of Design is nonetheless a new initiative in the Army. Introducing an innovation, even when it may be superior to current practice, does not

assure successful adoption of the innovation (Nord et al., 1987; Rogers, 1995). Introducing new ways of doing work into an organization can present a host of challenges that are often unrelated to the technical merits of new ideas, but nonetheless undermine successful implementation. The source of these barriers can be at the individual, team, and organizational levels.

As the Design concept is promulgated throughout the Army, it is valuable to consider the factors that might either inhibit or facilitate the adoption of Design across the force. To identify these factors, we examined literature on organizational change and diffusion of innovations. In the next section, we describe two relevant theories that are helpful to consider in framing the issues the Army is facing as it embarks on its initiative to institutionalize Design. These theories raise valuable questions and can inform potential strategies for facilitating the adoption of Design across the force.

Diffusion of Innovations Theory

Rogers' (1995) Diffusions of Innovations Theory explains how innovations (ideas, practices, objects) are adopted in a group or organization. Diffusion is described as the process by which an innovation is communicated through certain channels over time among members of a social system. Individuals go through a series of phases when exposed to innovations: knowledge, persuasion, decision, implementation, and confirmation. At any point in these phases, individuals may reject or adopt the new idea or practice.

Rogers (1995) outlines a set of key characteristics of the innovation that impact individuals' decisions to adopt it. These factors are summarized below:

- **Relative Advantage:** The degree to which the innovation is perceived as an improvement over the preceding idea or practice.
- **Compatibility:** The extent to which the innovation is perceived as consistent with existing needs, norms, values, and experiences.
- **Complexity vs. Simplicity:** The extent to which the innovation is perceived as easy to understand and use. If the innovation is too complex or difficult to use, individuals are unlikely to adopt it.
- **Trialability:** The ease with which an innovation may be experimented with on a limited basis.
- **Observability:** The extent to which the results of an innovation are visible.

Innovations perceived as having greater relative advantage, compatibility, simplicity, trialability, and observability will likely be adopted more rapidly than other innovations. Rogers (1995) also describes five categories of adopters, characterized by how quickly they adopt an innovation: innovators, early adopters, early majority, late majority, and laggards.

Within the diffusion framework, "word of mouth" is a critical element of influence in innovation decisions. Opinion leaders have a unique and influential position as change agents and within a system's communication structure, influencing potential adopters through their interpersonal communication networks in the community. These change agents may come from outside the organizational structure, but operate within the cultural boundaries to influence decisions to adopt an innovation.

Some of the strategies for successful diffusion of innovation that stem from Diffusions of Innovation theory include the following:

1) Have an innovation adopted by a highly respected individual within a social network, creating an instinctive desire for a specific innovation.
2) Inject an innovation into a group of individuals who would readily use an innovation.
3) Provide positive reactions and benefits (incentives) for early adopters of an innovation.

Kotter's Eight Steps to Organizational Change

Another framework with relevance to the Army's change efforts is Kotter's (1996) eight steps to organizational change. Kotter gleaned lessons-learned from his experience working with over one hundred organizations undergoing change. He has posited that over 70 percent of organizational change efforts fail because organizations often do not take holistic approaches to see the change through. Organizations often skip important steps for the illusion of speed, or they make critical errors in a given phase that slow momentum or negate the progress made. The set of critical steps Kotter contends are necessary for successful organizational change include:

- **Create a sense of urgency**. Arguably the most difficult step, this involves focusing attention on potential crises or opportunities that convince people that it is dangerous to maintain the status quo.
- **Have a guiding coalition to lead change.** Assemble a team of individuals who hold significant power to lead the change effort.
- **Create a vision** to guide the change effort and develop strategies to achieve that vision.
- **Communicate the vision** using every possible communication vehicle, and do so on a consistent basis. Teach new behaviors that are consistent with that vision through example of the guiding coalition.
- **Empower broad-based action**. Empower others to act on the vision by identifying and removing obstacles to change. Alter systems or structures that undermine the vision. Encourage risk-taking and non-traditional thinking and practices.
- **Generate short-term wins.** Plan for and showcase short-term wins. Reinforce the vision by recognizing and rewarding those involved in new practices.
- **Consolidate improvements and maintain change momentum.** Leverage increased credibility to consolidate improvements, and change additional systems, structures, and policies that do not fit the new vision. Hire, promote, and develop those who implement the new vision. Re-invigorate the process with new projects to keep the momentum for change moving.
- **Institutionalize new approaches.** Articulate connections between new practices and organizational effectiveness, and develop means to ensure continued leadership development and succession.

In viewing the Army's Design initiative through the lens of Rogers' (1995) and Kotter's (1996) frameworks, it raises several questions for consideration. For example:

- Has a sense of urgency been created? i.e., If we do not adopt Design, then…? How can Army leaders foster an increased sense of urgency?

- Has the Army articulated a clear vision for Design, and communicated that vision broadly and consistently?
- Has the innovation of Design—over and above mission analysis and conceptual planning—been well-articulated? Is Design perceived as an improvement over existing doctrinal practices?
- Does the Army have a well-crafted diffusion plan and mechanisms for effective communication of the ideas and evolutions of the Design concept?
- Is the practice of Design perceived as compatible with Army values and culture? If not, where does the incompatibility exist? How can we bring these elements into greater alignment so that they are perceived as compatible?
- Do members of the force have the opportunity to see results of Design application?
- Are examples or "small wins" being showcased to demonstrate the value of Design?
- What incentives are in place for practicing Design? Are there disincentives in place that need to be removed?
- What are the major obstacles to implementing Design that need to be removed so that the force is empowered to implement Design? What factors might undermine implementation of Design?

Consideration of these and other questions driven by theories of organizational change can provide important direction in facilitating the integration of Design into Army operations. These questions are addressed, in part, through the literature review and through the data collection efforts for the larger research effort of which this literature review is a part.

Conclusion

This literature review was a means to complement the data collection effort to identify key challenges in implementing Design across the U.S. Army and to develop recommendations for overcoming barriers and facilitating the institutionalization of Design. The review provides an overview of Design and describes some of the key issues that have emerged in the Army's discourse surrounding Design. It also provides an overview of two relevant theories of organizational change that offer a useful lens for considering the changes the Army is undergoing as it attempts to institutionalize the concept of Design and integrate it more fully into operations. The combination of the literature review and in-depth interviews with Army personnel provides a rich view of the set of issues associated with adoption of a new mindset for managing complex challenges that characterize contemporary military operations.

APPENDIX B
INCIDENTS AND EXAMPLES

Example #1: "Mapping out the Mess" (J5 Strategic Planner perspective)

The Context

I deal with the transition in Iraq from a military-led mission to a civilian-led one, as the US Forces drawdown by 31 Dec 2011. I truly deal with wicked problems. It involves working with interagency and understanding Iraq's political, economic, and security environment. So many things influence what direction you take for engagement and development in Iraq, and things change very fast due to the dynamics of our on-going relationship.

We used Design thinking fairly recently. There were issues we were facing about how to transition from a military-led to a civilian-led mission in Iraq. All the things the military was doing up until now—providing medical support, providing mail service, delivering food and fuel—we were asking the State Department to take over these essential activities. State has relied on DOD support for so long. You start pulling these things out of the mix and begin realizing, 'how are we really going to do this? Who will run the hospital in Iraq when the military is not there? What can we do? And what are the problems we need to focus on, given the current constraints and within the fiscal environment?'

Recognizing the need for problem framing

It's very easy to get locked into trying to fix one problem at a time or the one that is first in your inbox. You may not realize that it is actually not the main problem to fix right now. Our boss brought us into his office and said, 'we're losing touch here…We can't get our arms around what the important issues are that we need to work right now.' And I said, 'Sir, I think you should let us Action Officers go down to a room for a half day and reframe the problem. We need to map out the mess.' We needed to remove ourselves from our Joint Staff cube farm, get away from phone calls and email, and pack ourselves in a room for a couple of hours and really think through the issues.

Understanding the Problem

We looked at several different issues—everything from funding authorities, to privileges and immunities that the U.S. mission personnel must have in Iraq post-2011. We tried to reframe some of the problems that we were facing.

We were given four hours to do this. We could have used more time to clearly articulate it and come up with an approach. But there were time constraints. As we mapped out the mess, we discussed different issues and then focused on their interdependencies. We discussed everything from the funding appropriation language, to budget cycles, to potential agreements necessary to achieve the end state we defined from the beginning. We soon realized that we were actually not doing too badly, despite our initial assessment. We just needed to reframe our problem in a way that was understandable and could be acted upon.

The Process

I wanted to make sure that it wasn't too academic. I initially called it "Reframing Iraq." I put together about 10 slides in terms that the 4 of us would understand, without having to teach Design to somebody. I went through the SAMS Design Student Text to see if there was something that sparked my interest. I had some things in mind such as: we need to map out the various issues and how they relate to each other; what are the tensions between these relationships? Which ones could we affect change? And which ones, if left alone, will just go their own course? We needed to describe what our current environment was, and what we desired as our end state for transition in Iraq, based on national objectives.

I built the slide set based on the different frames of an approach to design thinking: an environmental frame, a problem frame, and developing an operational approach. Within each of those frames, we started looking at factors and their relationship to one another. In between each page in the slide deck, I had a blank page. It was a note page, because I really wanted them to doodle and be creative. I gave them those slides about a half day ahead of time.

I included a slide called 'boundaries,' which included a couple assumptions. I did this intentionally because we could continually 'what-if' a situation to death and that could unhinge our ability to move forward. We had to assume certain things.

By putting things on a whiteboard, it was easier to work through some of these relationships and issues. I acted as a recorder and drew all over the board. As we shuffled through different issues, we would erase, record, or re-diagram, and then we'd go from there. It just flowed. All thoughts were welcome.

Space and Materials

We wanted a room that had a lot of whiteboards, where we could walk around if we wanted to. The night before I packed a bag at work of markers, notepads, pencils, and folders, because you just don't know how it is going to take shape once you get there. I didn't want us wasting time looking for simple supplies.

Commander Guidance

We had our boss come down at the beginning. He told us one more time what he was looking for so we all clearly understood. His intent was very clear about making sense of the mess and defining the critical path. Then he wanted a narrative or framework for a paper that defined the critical path we needed to focus on for the next several months. He told us, 'if you reach a point where you hit a wall and need me to come down, I'll do that.' And we did. We reached a point where we wanted to bounce some ideas off of him and see what his thoughts were. So we brought him back down, identified the issue, and then moved forward.

Seeking Multiple Perspectives

There were only four of us. We thought about who else we needed to bring in. We brought in subject-matter experts and people from various Directorates on the Joint Staff. We brought them

in one at a time. If there was a funding problem, we had our money folks in there. If it was a discussion on authorities, protections or immunities, we had lawyers in there to make sure what we were saying was accurate and within the legal constraints. They came in for 15-20 minutes to look at how we were describing things, and they provided a sanity check.

The Product

At the end, we began outlining a paper describing the overarching issue and course of action. Then we each took a stab at various aspects of the outline. It became a living document. We also came up with a graphic to describe what we were trying to achieve.

Outcome

The Design process reaffirmed that we were actually heading in the right direction. It refocused everybody. It helped us better define the critical path that we needed to go down over the next several months in order to keep us moving towards transition. One of the biggest measures of our effectiveness was that we didn't have to dedicate so much time working on a solution to something that we determined wasn't critical at that time. On the Joint Staff, time is extremely valuable; we cannot afford inefficiency in our daily work as it leads to further inefficiencies and inaction to our warriors.

Example #2: "Illumination in Vietnam" (Commander perspective)

The Context

This is a retrospective view of what I think was Design. As a young Company Commander, I was leading a company of about 200 Marines in Vietnam. We had been sent into an area where the Viet Cong were firing rockets into an airbase. No unit had been able to stop them. There was nothing in my formal instruction about how to stop rockets being fired out of primitive areas into an airbase.

Organizing the Staff

I assembled my four platoon commanders. I had the intelligence officer come from the battalion. We brought in the forward air controller, the liaison officer from artillery support, and a couple other key people. And we just started talking about it.

Understanding the Problem

One of the things we learned was that Viet Cong didn't fire rockets whenever there was illumination. So if you had a full moon, they never fired. They never fired during daytime. The artillery liaison officer said—'sir, if we had 24 hours of daylight we wouldn't have this problem.' Later he asked if he could leave to get some material. When he came back he had a piece of cardboard on which he had laid out astronomical data for the next month—beginning with morning nautical twilight, sunrise, evening nautical twilight, sunset, and moon phases. Against that, he had plotted all the resources we had to put up illumination. He laid out a plan for where it would never be dark for more than 10 minutes in our area of operation.

Another thing we learned was that it took a flat piece of ground (about 20 x 20 ft) to fire these rockets. They could not fire them out of rice paddies, or any place where there was a lot of brush or trees. When he heard this, a lieutenant slipped off and came back with a map where he had highlighted every place in our AO that fit that description.

We did not compare options. We simply began talking about it. We started understanding what the logic of this problem was, and we developed a counter logic. The logic was they need darkness and a flat piece of ground, so let's get rid of the darkness. It came together into a coherent Design and plan. I think it's a question of: what sort of problem are you faced with? Does it lend itself to analysis? Is it so obvious that you understand what you need to do intuitively? Or is it one of these things that's a mess, and the only way you can approach it is sit down and talk to people who have the potential to have some insight into it?

Outcome

What eventually came together was: every area where they could fire from, we would either have one of our patrols on it, or we would fire a mortar or artillery on it every 15-20 minutes so nobody would have the opportunity to set up the rockets. We went more than 3 months without a single rocket coming out of the area. The enemy had previously fired rockets every few days.

Example #3: "Design During the Sunni Awakening" (S3 perspective)

The Context

During the Sunni Awakening, we did Design but we didn't call it Design. We started realizing that the same techniques we were applying previously wouldn't sustain security. We just weren't getting there using our standard process. That was our 'aha' moment. There was still conflict occurring, but it wasn't insurgency conflict. It was regular social conflict. A lot of the security structures that would be in a normal society (such as police forces) weren't there.

Understanding the Problem

We used the reflective-practitioner model where you look at a scenario you have never seen before, start applying action to it, and ask, 'is it working or is it not?' We got to the new problem statement through many engagements. We would make the decision to engage, get feedback, and then adjust based on that.

There was one particular clan further south (many of whom had American blood on their hands), and we were told by the previous unit: 'Isolate them. Don't engage. Keep them compartmentalized.' But we realized we couldn't secure the area unless we engaged with them. So we started making lots of engagements. We had to change our paradigm of who we were going to deal with. We knew we needed to do this in order to successfully accomplish our mission.

Re-Organizing the Staff and Re-focusing Intel Collection

When we realized we had to expand the way we think, it manifested in a change to the staff structure. In the beginning, our staff structure looked like any other staff structure geared toward

combat operations. Our lethal targeting cell was huge. By the end, we had reduced the lethal targeting cell to only a few. In addition, the non-lethal analysis cell had grown exponentially.

We kept about 90% of the people, but people changed functions. For example, we had a medical service officer who doesn't normally take lead on anything in the normal organizational structure. But this person was extremely smart in economics and marketing, and so he took the lead on several operations we were planning and provided oversight when people were executing those operations.

Our field artillery officers were well-trained in targeting. We took half the cell to stay as lethal targeting, and had the other half look at non-lethal targets. We tried to leverage the skills they had and show them how they could apply them differently. The same process of thinking that we applied to lethal targeting, we started applying to non-lethal targeting.

We had to have our intel officers stop looking at: Where are the terrorists? Instead, they started looking at: Who are the people who have leverage in society? Instead of looking for targets to attack or capture, we were looking at targets to support, reinforce, sustain, and connect with other aspects of society so they could build that network. I took expertise that is trained on the targeting function and had them change their focus. That is where we started getting payback on our investment.

Seeking Multiple Perspectives

We also brought outsiders into our planning meetings. We used the embedded Provincial Reconstruction Team. We had a great State Department person who taught city management. He would coach the city councils. We would sustain that, support that, and get him connected to the right people.

Also, we used the Department of Agricultural representative to help us look at canal systems because there was a huge water issue. We were next to a large river. But people were starving for water, and we didn't know why. The agricultural representative came in and helped us understand the canal systems, how it should work, how a canal undulates, and so forth. We started realizing things that helped us understand the water problems such as: 'this particular farmer blocked it off, either intentionally or unintentionally.'

Outcome

Originally, we were paying the most attention to kinetic activities. At the end, it was the non-kinetic things that were getting us traction. We had to change our rhythm—like how often we met for normal targeting meetings—and how much time we devoted to other issues. But, soon these other issues became the crux of the mission. The result was a reduction in violence and the return of displaced people. In our area, we had thousands of people coming back and settling. There were many things that showed progress and indicated that what we were doing was making a difference (like a wedding dress store opening, which was a joint business between Sunnis and Shi'ites). It showed some progress that these other activities were helping. Allowing structures of society to come back was alleviating the conflict.

Example #4: "Design over Dinner" (CJ5 Strategic Planner perspective)

The Context

The first Design effort in Afghanistan went for the whole year. We met two times a week. It was more of an informal Design effort that got punctuated every now and then with a task.

The Team and the Process

After the Operations order was written, I picked several people from the different sections of the Command and asked them to be part of a dinner group. We would discuss issues about Afghanistan. We made ourselves known to the command. We had NATO officers in that group, and other planners that weren't SAMS-educated.

The Command group had handed us a piece of information about the paramilitary police. They asked us to study the Afghan National police and how to make them better. That is the way we operated. We would take on a topic from the Commanding General, switch gears to that topic, and go back to the Commanding General with results and conclusions. Then we would move on to another topic.

Communicating the Ideas

Because we were not all planners, the ideas we came up with would bubble up in other shops in the Command. For example, the J3 used some of our ideas in his shop. He would take it back and influence things they came up with. So ideas got used that way. We were able to influence the Commander by having more than just planners involved. People from other shops would bring ideas from their shops with them into the group too. We would share ideas with them, and they would share with us. We would seed ideas within the Command that way.

Challenges

Getting other people into our group was tremendously frustrating. We were unable to get an Afghan to our meetings twice a week. We did get an Afghan police officer into our group a few times, but not permanently. Our command was a NATO command and it was hard to get people from other commands into the group, with the obsession with security. So getting different perspectives in the group was a massive challenge.

Example #5: "Ongoing Design" (Strategic Planner perspective)

Context

I worked in a future plans shop led by a Ph.D. who loved to get people around a table and explore problems by discussing them, which is a very large part of Design. It was continual learning through discourse. One of the problems we studied had to do with where troops would be staged. There were some original beliefs that the bad guys operated in a certain way.

Process

It was a constant discussion. It wasn't: 'let's rally around the table and have a Design team meeting.' It was a discussion that went on for weeks and months and happened at the dining facility, happened in front of the Commanding General, and happened at every level in between.

We had very open-floor discussions. We spent a lot of time arguing about whether something was a problem, what the environmental conditions were telling us, and what the underlying problems were that we were missing.

We would hammer through hard problems often over a meal, and then we would put together products and go to the Commanding General, present to him what we thought the problems were, and get his input. It was a continuous cycle of organizational learning.

We were deeply immersed in it. We would spend 18-20 hours a day with the exact same people. Tomorrow's conversation would pick up where last night's left off. We would work together to develop understanding.

Organizing the Staff

There was a core group of planners, which included the G5, two maneuver planners and a logistic planner. Those four guys were probably involved in every conversation. From there, we would add more depending on the problem we were addressing at the time.

At one point we did a project called 'safe neighborhoods,' where we started putting up concrete around the city and walling off the neighborhoods to reduce sectarian violence. As a strategic planner, I didn't need to be part of that conversation. For that, we brought an engineer to the table.

Investigating & Seeking Multiple Perspectives

The Commanding General was immersed in the same information that we were, so we didn't have to write deep information papers. It was a very organic conversation. We were all building the knowledge together. When we had real insights and epiphanies, the G5 would sit down with the Deputy Commander and talk through it and clarify the idea. Then the Deputy Commander would socialize the ideas with the General. So when we briefed him, the conversation had arrived before the briefing had. The ideas had already been aired.

Capturing & Communicating Ideas

We were shameless researchers. We contacted everybody. We had contacts with think-tanks. We went to different Intel agencies. We read books. We called friends that worked in units that were walking the streets. There was a person who was writing several articles on what was happening on the streets. We would call and talk to the battalions in those neighborhoods and would say: 'here's what this person is saying about what's happening on the street; what's your read on it?' We were going anywhere it made sense to get better information. We never knew exactly the right person to call. We would start with the people we knew; we would pick up the phone and

go from there. It was the same thing as doing any other type of research. You go into the library, read a book, and find a footnote that takes you somewhere. And then that takes you somewhere else. You follow it.

Outcome

The problem we studied had a lot to do with where the troops ended up being staged. There were some original beliefs that the bad guys operated in a certain way. But through our continuing research—going back to the library, looking at the Intel, talking to the experts—we recognized that where we originally thought we would put extra troops would not have solved any problems. We would have just had more guys on the street. It was discovering the enemy patterns of movement and the opportunity that presented. That led to where we put large formations on the ground.

Example #6: "Questioning Basic Assumptions" (Strategic Planner perspective)

The Context

One Design effort was with our sister command. They started their operations order about 6 months after I got there. They had a bunch of my classmates from SAMS there, and they were motivated to try Design before starting to plan. They got permission, resources, and personnel for two weeks. I was only able to sit in for one week. But I got updates on it later on, and I talked to guys about what happened afterwards and read their final products.

The Process

Broadly speaking, we did Design the way we were taught at SAMS. We spent about a week studying the environment, a week coming up with a problem, and a week coming up with solutions. We would take that product and infuse it into MDMP. We'd come up with an operations order that was influenced by what you took out of Design piece. We started out well. We stepped back, questioned assumptions, and tried to approach it from a new perspective. We started with Afghanistan and then drilled down to specific regions.

The overall campaign plan that ISAF came out with was in keeping with COIN doctrine -- secure the population, build good governance, encourage development, communicate (information operations) to make everyone understand what we're trying to do. We started questioning that on every assumption. One of the big assumptions that drives what we do is: if Afghanistan had good governance, they would not support the insurgents. We didn't want to assume that that was true. We thought that came from *our* understanding of governance. In the U.S., you want a mayor and police chief that was appointed properly. In another country, if the mayor doesn't come from your tribe, then he's not a good governor. For the first five days, we really got into doing that on every assumption that higher had pushed down on us. Then on the 6th day, that kind of came to a stop.

Challenges and Obstacles

At some point, you need to come to consensus on something. We struggled with: do we go with a vote? Or do we come up with some kind of consensus piece. Once we actually come up with

something, how do we go on to the next step even if everyone isn't convinced? We really struggled with that.

We brought some of the ideas to the larger group (we had done breakout groups; I was in the security group). We were questioning whether the good governance efforts would help our efforts. We had been operating on the assumption that if the good governance efforts were successful then security would be successful. When we brought it into the larger group, it was pushed aside pretty quickly. It didn't jive with what we had done at Leavenworth. And it didn't jive with what the Commanding General thought, or with FM 3-24 [Counterinsurgency Doctrine]. We bumped into bureaucratic issues there. So, we ended up defaulting to what we'd come up with at Leavenworth, or what they thought the Commander thought.

The assumption of: people mattered; they are center of gravity. We questioned that. We suggested that maybe security should be focused on power brokers. In the timeframe NATO forces were expected to show results, perhaps focusing on individual rights would not increase security. Working through current power structures would be more effective. The answer we got back was: 'of course people are the center of gravity.' That came from an American centric view of the world. We believe the world works in a certain way. Other people see people differently. Design was suppose to get us to think from different perspective. These were SAMS trained people saying, 'of course you're wrong; the people are always the center of gravity. We have to protect the people.' So, we were unable to get out of our American selves.

I think the planners were faced with 2 main obstacles: First, the Commanding General had steadfast opinions about what made things run in the region. Those wouldn't be easily overturned. And he wasn't all that involved in the effort. Because he wasn't involved, he missed out on the logic behind our efforts. So it was hard to convince him at the end.

The other obstacle was that we had spent a year studying Afghanistan at SAMS. We struggled with getting away from what we came up with at Leavenworth. We brought the spaghetti chart with us. We all loved that stuff, and we struggled with getting away from it. We were still stuck with our assumptions that we thought up at SAMS. Design literature suggests that once you get into the environment, you find out that things you thought were true are not. You start seeing things in the environment that cause you to question your assumptions. We didn't really do that. Our product wasn't that different from what we'd come up with at Leavenworth, and then the Commander wasn't involved enough to really get the logic so it didn't really make it into the plan.

Example #7: "EUCOM Strategy: A strategy of Active Security" (Commander perspective)

The Context

Our primary challenge was a large, incredibly diverse 92 country AOR [Area of Responsibility] filled with countless problems and challenges for the Command. We had many different lines of operation—counter proliferation, counter trafficking, and an AOR that was rampant with humanitarian disasters. We also had regional issues: West Africa was different than Eastern Europe, Eastern Europe was different from Western Europe, and Western Europe was different than Eurasia or sub-Saharan Africa. Our staff and components had a large number of ongoing

actions and programs, all good, but hardly cohesive, focused or converging on a well defined, well understood end state. We were trying to work our way through this.

Understanding the Problem(s)

Design offered us a framework and mental approach. We didn't adhere to any particular process because the problem itself was so complex. We began by figuring out that process by which we could understand the array of complexities and problems of the AOR, and lead us to meaningful strategic solutions.

I didn't call it 'Design.' This wasn't about achieving Design for the sake of Design. It was about understanding the complexities of what we were trying to solve, and working our way through identifying our objectives and how we would achieve them.

John Schmitt's [2006] paper presents the idea of the 'wicked problem', or very complex problem. Our challenge wasn't simply: 'come ashore at 0800, cross Red Beach, and seize the airfield.' You certainly have to go through a deliberate planning process for that; there's no question about it. Our challenge, however, was something far more complex and very difficult to take on. We didn't know what end state we wanted or exactly what it would look like. So we had to really think our way through it.

Some people on the team had preconceived ideas of what the strategy was to be, and they wanted to start writing it right away. That was an 'opinion based' approach, and not acceptable. My guidance was, 'anybody who puts any words to paper right now is off the team because you have a preconceived notion of a solution to a problem that we do not yet understand.' I had them break down the process and look at the challenges we faced. It took a while for some of them to come on board, but once they understood that I wasn't going to allow them to do anything until we figured that piece out, they poured their brains into it.

The initial framework by which we analyzed the AOR and developed solutions, changed iteratively as they applied it, particularly during the AOR analysis. I believe that was consistent with the tenants of Design, by being open ended and always learning.

It took about three weeks once they got their heads into it. And it was unbelievable what came out as they started to apply the ideas imbued in Design. Though we didn't call it Design, I believe what we did was in the construct of Design–with continual learning, adjustments, and revisions by the team.

I was reasonably engaged throughout, providing the higher order discourse in the effort. I routinely spent time with the team, either by invitation or injection, as I monitored their progress. I questioned assumptions and conclusions, sought disconfirming information to those, and sent them back to answer further questions, or validate assumptions and conclusions. The discourse was often passionate and emotional, but I believe an essential element, in keeping with Shimon Naveh's concept of 'Design', that dialogue was essential to the workings of the planning team and our product.

The Product(s)

The initial product of Design was a structured framework that enabled a multi-tier, comprehensive analysis of the AOR against US interests. This was briefed to the Command, and began with presentation of the problem. That is the first critical step. We had a host of ongoing actions and programs. All were good, but not necessarily knitted into a cohesive whole. We were trying to manage various components and associated activities that were generally chosen by the component for their own interests, rather than directed to an established end state. We had no real prioritization, no meaningful measurable effects, and no specific end states. With limited time and resources, we were not getting the best return on investment.

That elaborate briefing presents a progression of thinking in our approach to the very complex problem presented by the 92 country AOR, through our conclusions of interests, outcomes and goals in the AOR. The most critical slide in the brief is the 'Strategy Design Framework.' That is the slide that took some 3 weeks to figure out, and was modified and refined in the learning process. (see below)

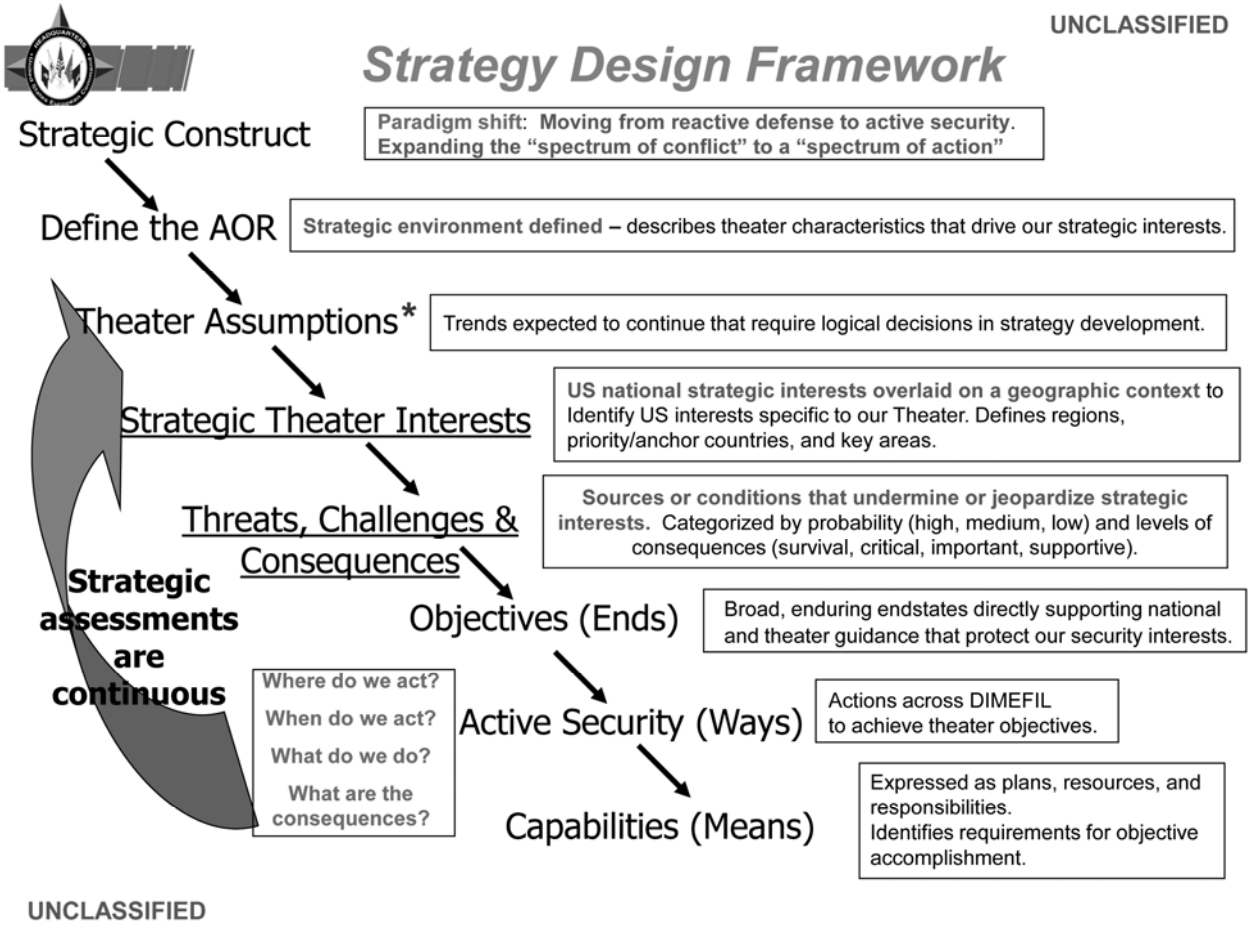

Figure B-1. Example product of the EUCOM Design effort.

Absent that slide, we never, ever could have come to anything that mattered. We would have produced another glossy of things that make one feel good, are all valid, but ultimately would not have changed behavior in the Command.

We believe we gained credibility as we presented our strategy and where we were going as a Geographic Command. The subsequent iterative step was building the campaign plans that pulled in the staff and components in meaningful ways. Presenting the logic of the process as part of the outcomes gained us more than the old strategy quad chart with seven strategic objectives and ten strategic effects.

The Outcome

We had success in influencing the Office of the Secretary of Defense (OSD) Policy with thoughts that spurred changes in the challenge of engagement that they were struggling with. Our key outcomes were to move from the Spectrum of Conflict to a Spectrum of Actions. I was fascinated by the concept of "pre-insurgency" presented by John Schmitt and Lt Gen PK Van Riper (ret), and we took that further as we looked at the problems across the AOR--pre-crisis, pre-chaos, pre-collapse, pre-conflict. That led us to recognize that we were institutionally poor at prediction, and we were continually reactive. We needed to shift to something better suited to a world we could not predict, and that became being proactive. The concept of 'Active Security' advanced the idea of moving strategically from 'Prediction', upon which we seemed to be effectively anchored, to 'Positioning'. That translated into Access, Influence and Presence. We believed by working well in advance of problems, we could position ourselves to manage things as they began to unfold.

The Design framework element of the EUCOM strategy was utterly brilliant and Design thinking was crucial to achieving our end state. At the start we had some pieces of the plan, but it was disjointed. It all sounded great but it generated no cohesive understanding or activity. In the process of us breaking this down and then rebuilding it, we came up with some very novel approaches, and insights that changed long standing paradigms. It was exceptionally well thought out because we committed ourselves to this particular process with no preconceived solutions.

Example #8: "Discourse in Iraq" (Brigade Commander Perspective)

The Context

In Iraq my S2, S3, and I would talk all the time – it was really Design. It was a continual process. Part of the problem was the city government had collapsed and we didn't quite understand how things worked to begin with, so we needed to figure that out. And then we needed to figure out what we needed to do to stand it back up.

The Process

My daily battle rhythm involved spending first part of the morning reviewing intel reports. I would discuss these with the S2. We just talked about things like: Who is the enemy? What is the enemy doing? We came up with a lot of different models, many of which we threw out. Afterward I'd go out on battlefield circulation and attend meetings. Then I'd have dinner with the S3. The S2 would usually join as well. At night, I'd stay up reading. I was comfortable debating things with my subordinates. Other officers want to be in control. They don't want give and take. Not many are comfortable with discourse.

The Design Team

I used the Commander of the Engineering Battalion a lot for Design. He was very intelligent and perceptive. He was creative and could think in a larger framework about what was going on--especially in Baghdad where part of the problem was standing up essential services. Having an engineer to figure out how the city worked was helpful. You don't know what the solution is until you know what the problem is.

He and I thought a lot about how Baghdad operated. The Commander of the Engineering Battalion would go and find out things. For instance one of the things he found out was that in our zone, every week there'd be a meeting of the director generals for various essential services in Baghdad (people in charge of controlling services). He was the only one who attended it.

He told me this was happening and I sent this info up the chain thinking that other folks might want to come to this meeting. We couldn't get any interest because it was in my zone. We have this geographical conception that if something is outside your zone, then you have nothing to do with it. And yet here was something that clearly affected the whole city. We've grown up in the military way of thinking; we have a left boundary and a right boundary. That's your zone; you don't cross over the boundary. And in Iraq, this was a different kind of war and nobody else was recognizing those boundaries. Insurgents certainly aren't recognizing them. Guys on the ground aren't. Yet that's our framework of thinking.

You pull guys into your Design team who can think. I figured out quickly that person was an intelligent guy. Those who weren't, I wouldn't rely on as much. It wasn't like he didn't have responsibilities of his own; it just turns out he had the right tool set.